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Food Security, Food Assistance Program Participation and Diet Quality Among Food Pantry Participants in the North End of Hartford

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Food Security, Food Assistance Program Participation and Diet Quality
Among Food Pantry Participants in the North End of Hartford

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B.S., Syracuse University, 2009

A Thesis

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Master of Science Thesis

Food Security, Food Assistance Program Participation and Diet Quality
Among Food Pantry Participants in the North End of Hartford

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ABSTRACT

Objective: To examine the association between food security, participation in food assistance programs and diet quality among food pantry users in Hartford, Connecticut. **Design:** Observational analysis of baseline data from a randomized control trial. Randomized control study design using pre-post test surveys with repeated measures at baseline and 3 months follow-up. **Participants:** All study participants were over 18 years old; a resident of one of three Hartford zip codes (06105, 06112, 06120); spoke English; and receive food from a Hartford food pantry. Only one participant in each household was allowed to enroll. Two hundred and twenty six food pantry users recruited from two food pantries in the North End of Hartford. **Intervention:** Data was collected from July 2010 to June 2011 as part of an evaluation of Freshplace. Freshplace is a new client choice food pantry and community-based project developed by the Chrysalis Center, Foodshare, the Junior League of Hartford, and researchers at the University of Connecticut. The Freshplace program allows participants access to fresh food at the pantry once every two weeks, individualized meetings with a Case Manager and referral services tailored to help meet their goals of becoming more food secure and self-sufficient. The control group was instructed to continue their usual routine in using food pantries around Hartford to obtain food. **Main Outcomes:** Food security measured using the 18-item United States Department of Agriculture (USDA) Food Security Module, participation in food assistance programs, and diet quality measured by the Block Rapid Food Screener. **Results:** At baseline 85% of food pantry participants were food insecure (low or very low food security) indicating that only 15% were food secure (high or

marginal food security). The three most used food assistance programs were Supplemental Nutrition Assistance Program (SNAP), food pantries and soup kitchens. Overall findings showed that food pantry users had diets “very high” in fat intake and lacking in fruits and vegetables (80% consuming <5 servings/day). Changes in baseline to three months were assessed between the randomized food pantry users at Freshplace (n =112) and in the control (n= 114). Over three months, 22% of Freshplace participants moved from food insecure to food secure status and 7 new households were enrolled in SNAP. When analyzing diet quality, Freshplace participants had a greater average intake of fruits and vegetables, but higher fat and snack intake (higher total fat, saturated fat and cholesterol) than the control group. Average dietary fiber intake in both groups was below recommended levels. When assessing daily micronutrient intakes, Freshplace participants had greater average intakes of vitamin C and magnesium compared to the control group. Significant differences ($p = <.05$) for change in dietary intake were found for fruit and vegetable intake, dietary fiber, vitamin C, and magnesium in both groups. **Conclusion:** Food pantry users in Hartford are at risk for food insecurity, nutritional deficiencies, high fat intake and overweight/obesity. They also have low participation in eligible food assistance programs. Participants involved at Freshplace for 3 months had greater changes for fruit and vegetable intake and SNAP enrollment, when compared to the control group. Freshplace may serve as a model for improving the food security and nutritional status of food pantry users in other communities. Further examination of food security, diet quality and participation in food assistance

programs is needed in areas where residents rely on food pantries to meet food needs.

INTRODUCTION

Despite the wealth and abundance of food in the U.S., some adults, families and children struggle to put food on the table each day. According to the USDA Food Assistance and Nutrition Research Report, while most U.S households in 2010 reported food security (85.5%), a minority of households (14.5%) reported experiencing food insecurity some time during the year, including limited access to adequate food due to lack of money and other resources (Coleman-Jensen et al, 2011). Food insecurity negatively impacts nutritional and non-nutritional outcomes throughout one's life including increased risk of chronic disease, poor social skills and academic development, physiological stress and nutrient deficiencies (Cook et al, 2004; Jyoti et al, 2005; Rose, 1999; Tarasuk et al, 1999).

Federal (public) food assistance programs act as the first line of defense in preventing health issues from emerging within low-income households by enhancing their food purchasing power and nutritional status. The largest public assistance programs include: The Supplemental Nutrition Assistance Program (SNAP formerly known as food stamps); the Special Supplemental Nutrition Program for Women, Infants and Children (commonly referred to as WIC); and many child nutrition programs such as the National School Lunch Program and School Breakfast Program (USDA, 2011). Despite the high number of individuals, families and children whom are eligible to receive benefits from federal food assistance programs such as SNAP or WIC, there is a gap in the number of those enrolled.

Private food assistance programs referred to as Emergency Food Assistance System (EFAS), compliment food provided by public assistance programs and include food banks, food pantries, soup kitchens and shelters. Feeding America is the nation's leading domestic hunger-relief charity that has a network of more than 200 food banks in all 50 states. These food banks secure and distribute more than three billion pounds of food and grocery products to more than 61,000 local charitable agencies that provide food directly to individuals and families in need (Feeding America, 2010).

Despite these public and private efforts, individuals who are food insecure have elevated risk of poor dietary quality. Dietary quality is defined by the Dietary Guidelines for Americans and USDA's MyPlate (created as a supplement to MyPyramid) (USDA, 2010). According to an NHANES analysis, fewer than 1 in 10 Americans meet energy-specific fruit or vegetable recommendations (Kimmons et al, 2009). The numbers become even smaller for high-risk populations such as low-income and ethnic individuals. Research has shown that income and food security level can affect overall health and diet quality (Cook et al, 2004; Duffy et al 2009, Mello et al, 2010).

Food pantry clients generally have high levels of food insecurity, obesity and poor diet quality (Duffy et al, 2009). Individuals who rely on food pantries have limited access and resources to purchase food items, specifically fresh fruits and vegetables, lean meats, whole grains and low-fat dairy products (Algert et al 2006). Unfortunately, highly processed items with added sugar, salt and fat are more available and affordable than the recommended healthy items

(Drewnowski et al, 2005). The oversized portions and convenience of low cost foods, in addition to low satiating factors, may be a culprit for overeating and weight gain among low-income and food insecure populations (Algert et al, 2006; Drewnowski et al, 2005). Food pantry use is especially high among low-income households, particularly Black and Hispanic households, those with children headed by single women, those living in cities of metropolitan and nonmetropolitan areas, and households in the Midwest and West (Nord et al, 2010).

In response to chronic rates of food insecurity and poor diet quality, a new food pantry called Freshplace was established in 2010. Freshplace is an innovative fresh food pantry and resource collaborative located on Homestead Avenue in Hartford, Connecticut and was founded by the Chrysalis Center, the Junior League of Hartford, and Foodshare. This pantry was established to foster long-term food security and self-sufficiency among residents of the Upper Albany neighborhood in Hartford through offering fresh produce and individualized case management. Freshplace is designed to include a supermarket client-choice food pantry, which allows participants to self-select food items that are suitable to their taste, family and cultural needs. Freshplace clients also meet monthly with a Project Manager to receive individualized case management. To evaluate Freshplace, the three founding community agencies have partnered with researchers at the University of Connecticut.

Study Aim

The aim of this thesis is to identify some of the characteristics and nutritional concerns related to food insecurity among a sample of food pantry clients, including Freshplace clients. Specifically identified were the relationships between food security (measured by the USDA Food Security Module), participation in food assistance programs, and dietary quality (fruit and vegetable, meat and snack, and fiber consumption measured by the Block Rapid Food Screener, Block et al, 2000). In addition, this thesis included a pre- post test comparison between participants of Freshplace versus control participants from another traditional food pantry over 3 months for food security and dietary quality.

The data for this research were gathered at baseline and then three months, as part of a larger longitudinal evaluation of Freshplace that spans 18 months. The data and findings from this research will be shared and utilized by three community partners and academic audiences concerned about food insecurity. Considering there is a food pantry in nearly every community throughout the U.S., the information generated by this thesis and the evaluation of Freshplace can easily be translated to the larger public. The findings will give food donors a better understanding of food pantry users and their dietary challenges.

BACKGROUND

Food Security

Food security refers to a household's access and availability to an adequate food supply. Food security is considered one of several conditions needed for a population to be healthy and well nourished. By USDA definition, food security is the access by people, at all times, to enough food for an active, healthy life and includes at a minimum, availability of nutritionally adequate and safe foods, and the ability to acquire food without resorting to emergency food supplies (Anderson, 1990; Bickel et al, 2000). Food insecurity occurs when there is limited or uncertain availability of nutritionally adequate and safe foods or results in acquiring food in socially unacceptable ways such as scavenging, stealing or other coping strategies (Anderson, 1990).

Since 1995, the USDA has annually collected information for the U.S. population on food spending, food access and adequacy, sources of food assistance, and measured food security using the 18-item USDA Food Security Module. The Module is conducted as a supplement to the nationally representative Current Population Survey (CPS) (Nord et al, 2010). The Module asks one adult respondent in each household a series of questions about experiences and behaviors that indicate food insecurity, such as being unable to afford balanced meals, cutting the size of meals because of too little money for food, or being hungry because of too little money for food (Appendix 1). The household food security status of each interviewed household is determined from the number of reported food-insecure conditions and behaviors that distinguishes

households having difficulty meeting basic food needs. Food-insecure conditions are indicated by affirmative responses to questions.

Food insecurity varies through a continuum of successive experiential and behavioral stages as food-insecure conditions become more severe. Each stage consists of characteristic conditions and experiences of food insufficiency to fully meet the basic needs of household members and of the behavioral responses of household members (Bickel et al, 2000). The USDA uses the following food security classifications:

High Food Security: Households with minimal to no evidence of food insecurity. These households report experiencing no food-insecure conditions.

Marginal Food Security: Households reporting “yes” to one or two food-insecure conditions with little or no indication of change to members’ food intake. Household members are concerned about adequacy of the household food supply and in adjustments to household food management, including reduced quality of food and increased unusual coping patterns.

Low Food Security: Households reporting multiple food-insecure conditions. These households report reduced quality, variety or desirability of their diet. Food intake for adults in the household has been reduced to an extent that implies repeated physical sensations of hunger. In most (but not all) food insecure households with children, such reductions are not observed at this stage for children.

Very Low Food Security: Households without children report six or more food-insecure conditions, while households with children report eight or more

food-insecure conditions, including conditions among both adults and children. These households have disrupted eating patterns and reduce food intake among one or more household members because of insufficient money and other resources for food. At this level, adults in households with and without children repeatedly experience more extensive reductions in food intake. Children of these households have reduced food intake to an extent indicating hunger and for some other households with children, this occurred at the previous stage (Bickel et al, 2000).

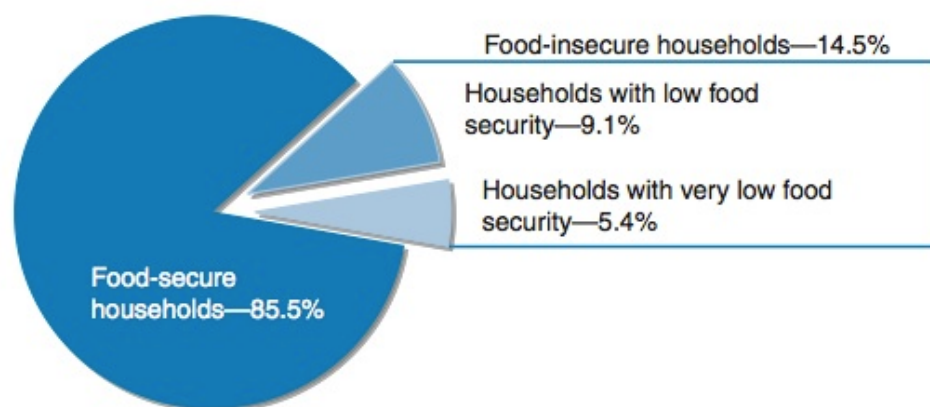
The categories of high and marginal food secure categories are combined into “food secure,” and low and very low food secure categories may be combined into one category called “food insecure” (FRAC, 2009).

Prior to 2006, households with “low food security” were described as “food insecure without hunger” and households with “very low food security” were described as “food insecure with hunger” (Nord et al, 2010). By recommendation of the Committee on National Statistics, the USDA changed the terminology used to describe food security status by eliminating “hunger” from the new classifications to distinguish the physiological state of hunger from indicators of food availability (Mabli et al, 2010). As these definitions imply, hunger and undernutrition may occur as a result of food insecurity, depending on its severity and duration (Cook et al, 2004). The classification of households into three levels and the word “hunger” in the food security questionnaire remained the same, while the word “hunger” was removed from the description of the survey results.

Prevalence of Food Insecurity in the United States

In 2010, one in five Americans struggled with “food hardship” (FRAC, 2011). Findings from the 2010 CPS indicated that 48.8 million Americans, consisting of 32.6 million adults and 16.2 million children, lived in food insecure households (Coleman-Jensen et al, 2011). The percent of food insecure households remained essentially unchanged from 2008 (14.6%) to 2009 (14.7%) to 2010 (14.5%), and was at the highest recorded level in 2009 since the first CPS Food Security Supplement data was collected in 1995. However, the prevalence of very low food security showed a statistically significant decline from 2009 (5.7%) to 2010 (5.4%). Shown in Figure 1 about one-third of all food insecure households experienced very low food security (6.4 million households), the most severe level of food insecurity in 2010 (Coleman-Jensen et al, 2011). Most commonly, very low food secure households experienced the condition in 7 months of the year, for a few days in each month.

Figure 1. U.S. households by food security status, 2010 (Coleman-Jensen et al, 2011)



Rates of food insecurity in 2010 were substantially higher than the national average among households with incomes near or below the Federal poverty line (33.8%), among households with children (20.2%), especially households headed by single women (35.1%), or single men (25.4%), and among Black non-Hispanic (25.1%) and Hispanic households (26.2%). Among households with children, those headed by a married couple showed the lowest rate of food insecurity (13.8%). In 2010, the statistically significant decline in very low food security was greatest for households with children, women living alone and households with annual incomes below 185% of the poverty line (Coleman-Jensen et al, 2011). Food insecurity was more common in large cities and rural areas than in suburbs and other outlying areas surrounding large cities.

Children were food insecure at anytime during 2010 in 3.9 million households (9.8% of households with children), a decline from 10.6 percent in 2009 (Coleman-Jensen et al, 2011). These households showed difficulty in providing nutritionally adequately meals for their children. Although children are usually shielded from disrupted eating patterns and reduced food intake, children along with adults experienced instances of very low food security in 1.0 percent of households with children (386,000 households) in 2010, essentially unchanged from 1.2 percent in 2009 and 1.3 percent in 2008 (Coleman-Jensen et al, 2011; Nord, et al, 2010). The characteristics of households with food-insecure and very low food secure children was most prevalent among female-headed households, Black, non-Hispanic and Hispanic households, households

with incomes below 185% of the poverty line and those within principal cities of metropolitan areas.

Prevalence of Food Insecurity in the Northeast

The presence of food insecurity varies considerably from each geographic region and within each state. Of all regions, the Northeast has held the lowest rates for food insecurity (12.4%) compared to the South (16%). In 2010, 17.9% (1,201 households) of households with children in the Northeast were food-insecure. Of those food-insecure households with children, 8.6% experienced low food security and 0.7% experienced very low food security (Coleman-Jensen et al, 2011). Although Connecticut is one of the wealthiest states in the nation, it has one of the highest rates of income disparity, which is associated with health risks, food insecurity and hunger. Food insecurity in Connecticut should not be of great concern yet of the 1.4 million households in 2010, 172,000 (12.7%) of households were food insecure, 66,000 (4.8%) of those households considered to have very low food security (FRAC, 2010). Prior to the recession, the Connecticut Food Bank surveyed food pantry and soup kitchen clients who revealed that 42% had to choose between food or utilities, 34% had to choose between food or rent and 30% had to choose between food or medical care (Connecticut Food Bank, n.d.)

Causes of Food Insecurity

While there are many underlying factors related to food security, poverty has been strongly associated with food insecurity and hunger in the U.S. (Boyle et al, 2006; Coleman-Jensen et al, 2011). Food insecurity results from financial

constraint leading to a decrease in food budget. More specifically, food insufficiency refers to an inadequate amount of food intake due to resource constraint (Jyoti et al, 2005). In the most basic sense, households experience food insecurity when their resources are inadequate to obtain "enough food" to meet basic needs. In 2009, food insecurity was four times more prevalent when households had an annual income below 185% of the federal poverty guideline as compared to households above that level (Nord et al, 2010). Nearly 9% of Connecticut residents live in poverty (U.S. Census, 2011). Of the 9,248 residents living in the Upper Albany neighborhood, where Freshplace is located, 32.5% are living below the poverty level, even higher than the city's overall rate (City Data, 2011). In 2009, the median household income among Upper Albany residents was \$27,396 (City Data, 2011).

The causes of food insecurity are complex and extend beyond insufficient income. Not all food insecure households live in poverty, and not all households living in poverty are food insecure. Using data from the Current Population Survey, 20% of food insecure households had midrange or high incomes (Nord et al, 2002). A diverse and extensive range of barriers impede procurement of adequate food such as financial constraints associated with income and job loss, the high cost of a nutritious diet, and limited access to large stores with more variety and lower prices (Mabli et al, 2010). Low-income individuals often live in fragile situations where one event can trigger a stress on the household budget, which forces households deeper into poverty thus becoming food insecure. Food insecure households are much more likely to have experienced recent events

that stress household budgets, such as losing a job, gaining a household member or losing food assistance benefits (Biggerstaff et al, 2002; Rose, 1999). These life events may burden the household budget, which may not be accurately captured in annual income measures (Nord et al., 2005).

Very low food security, resulting in reduced food intake and disrupted eating patterns, is usually occasional or episodic and not usually a chronic problem. When interpreting food security measures it is important to note that the questions used to assess household's food security status ask whether a condition, experience, or behavior occurred at any time in the past 12 months, and households can be classified as having very low food security based on a single, severe episode during the year. Therefore, it is possible that a single episode of food insecurity in the last year could classify the household as food insecure (Nord et al, 2010).

Coping Strategies Among Food Insecure Households

Households experiencing limited resources and difficulty meeting their food needs utilize a variety of coping strategies to help supplement the food they purchase. Food acquisition and management coping strategies are practices used to obtain food and maintain their food supply after it is acquired, thus avoiding food insecurity and food insufficiency (Kempson et al, 2003).

Households can reduce food expenses when income levels fall. Based on the USDA Economic Resource System analysis, the typical U.S. household spent \$43.75 per person each week for food in 2010 (Coleman-Jensen et al, 2011). As expected, households with higher incomes spend more money on food

than lower income households. When comparing households of similar size and composition, the typical food-secure household spent 27% more on food than the typical food-insecure household (Coleman-Jensen et al, 2011; Kaufman et al, 1997). Households utilized a combination of stores, discount coupons, and sales to obtain foods and ingredients. Ways of stretching foods at home include preparing food in bulk, utilizing leftovers, freezing food for later use, using food substitutions such as powdered milk for fresh, reducing or omitting unaffordable ingredients such as meats, increasing amount of inexpensive and filling ingredients such as potatoes and rice (Hoisington et al, 2002).

Individuals use support system members to acquire food and maintain food sufficiency according to semi-structured interviews with SNAP program users in New Jersey regarding food management practices (Kempson et al, 2003). These support systems included pooling together food with others to make a meal, utilizing company donations of food to needy employees, trusting in God to make it through tough times, and receiving general help from others such as parents, family members, and neighbors to assist with food sufficiency maintenance (Kempson et al, 2003). More desperate coping strategies were used as food becomes scarce and other problems become more apparent in the household. More severe reported strategies include selling one's blood, salvaging road kill, participating in research and committing crimes with the intent to be sent to jail. In more rural areas, individuals also rely on gardening, fishing and hunting to acquire food (Kempson et al, 2003).

While a portion of individuals and households adopt cost-saving practices, such as buying products that are on sale and buying products in bulk, many low-income households find it necessary to rely on an extensive network of public and private emergency food providers to maintain an adequate food supply. Findings from the 2010 CPS indicated that, in the previous month, 59% of food-insecure households reported participation in at least one or more of the three largest Federal food and nutrition assistance programs—Supplemental Nutrition Assistance Program (formerly Food Stamp Program); the National School Lunch Program; and the Special Supplemental Nutrition Program for Women, Infant and Children (WIC) (Coleman-Jensen et al, 2011) shown in Table 1.

Table 1. Participation of food-insecure households in selected Federal food and nutrition assistance programs 2010 (Coleman-Jensen et al, 2011)

Program	Share of food-insecure households that participated in the program during the previous 30 days ¹	Share of households with very low food security that participated in the program during the previous 30 days ¹
	<i>Percent</i>	
SNAP ²	40.9	41.5
Free or reduced-price school lunch	32.4	27.2
WIC	13.6	9.8
Any of the three programs	59.2	55.9
None of the three programs	40.8	44.1

SNAP (Supplemental Nutrition Assistance Program) was formerly called the Food Stamp Program

WIC is the Special Supplemental Nutrition Assistance Program for Women, Infants and Children.

In 2009, 4.8 percent of all U.S. households (5.6 million households) accessed emergency food from a food pantry one or more times (Nord et al, 2010). In 2009, food insecure (low food security or very low food security) households

were 15 times more likely than food-secure households to have obtained food from a food pantry (Nord et al, 2010).

Federal Food and Nutrition Assistance Programs

In response to hunger and food insecurity, the USDA Food and Nutrition Service (FNS) established and currently regulates a network of 15 domestic food and nutrition assistance programs. Starting in the 1930's and largely created in the 1960's and 1970's, these programs act as a "safety net" in addressing the needs of food insecure populations by providing access to food, a healthful diet and nutrition education. In 2009, the United States spent more than \$90 billion on nutrition assistance programs for the U.S. population (Andrews, 2010). Below is a brief review of the three largest programs in order of participation and U.S. expenditure.

The Supplemental Nutrition Assistance Program (SNAP) formerly called the Food Stamp Program was first developed to help distribute excess farm commodities and boost farmers' income during the Great Depression, and then was reestablished as a permanent program in 1964. The program provides monthly benefits for eligible low-income households to purchase approved food items at authorized food retailers. Clients qualify for the program based on available household income, assets and various living expenses. SNAP aims to help prevent household food insecurity and its consequences by helping low-income households obtain a more nutritious diet by increasing their purchasing power and lack of nutrition knowledge (USDA: FNS, 2012). In 2010, the program benefited 40.3 million (13% of individuals) people in the United States (Coleman-

Jensen et al, 2011). Through the electronic benefit transfer system (EBT), the use of food “stamps” is no longer the means in which a client receives their benefits. EBT replaces the paper coupons through use of a benefits card, similar to a bankcard. Eligible households are provided with cash equivalents, called allotments, equal to about 70% of their estimated food budget to purchase food intended to be prepared at home (Frongillo et al, 2006). The maximum monthly allotment for a household of four is \$668 (USDA: FNS, 2012). In 2010, the average benefit was \$134 per person per month, and total Federal program expenditures were \$68.2 billion (Coleman-Jensen, et al 2011).

The National School Lunch Program (NSLP) was established under the National School Lunch Act, signed into law by President Harry Truman in 1946 after over 100 years of research and evaluation for the best practices in food and nutrition service for millions of American school children. The program was started because many young men were considered unfit to serve in the military because they were malnourished (USDA: FNS, 2012). The NSLP is a federally-assisted meal program, which operates in over 101,000 public and nonprofit private schools and residential child-care institutions. In 2010, the program provided lunches to an average of 31.6 million children each school day (Coleman-Jensen et al, 2011). Based on household income, children are eligible for free meals (income up to 130% of poverty), reduced-price meals (income from 130 – 185% of poverty), or pay full price. All meals served receive Federal subsidies for nutritionally balanced lunches. Fifty-six percent of the lunches served in 2010 were free, and an additional 10% were provided at reduced prices

(Coleman-Jensen et al, 2011). Since the modern program began, more than 219 billion lunches have been served (USDA: FNS, 2012).

The Special Supplemental Nutrition Program for Women, Infant, and Children known as WIC, was created in 1974 as a response to the widespread hunger and poverty and the dangerous consequences of inadequate nutrition to pregnant women, new mothers, infants and children. WIC is a preventive nutrition program that provides grants to States to support the distribution of supplemental foods, health-care referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and their infants and children who are younger than 5 years of age and are at nutritional risk (USDA: FNS, 2012). The goal of WIC is to prevent nutrition-related health problems from developing. Each month in 2009, more than 9.1 million individuals, consisting of 2.2 million women, 2.2 million infants and 4.7 million children, relied on benefits received from the WIC program with an average monthly cost of \$42 per person (Food Research and Action Center, 2010; Oliveria, 2010; Nord et al, 2010). Most State WIC programs provide participants with vouchers to acquire supplemental food packages at authorized food retailers. In 2009, the USDA issued new regulations for an improved WIC food package to increase the health and nutritional quality of the foods in the program, increase participants' choices, and expand cultural food options. The new package offers fruits and vegetables, whole grain rice, bread or tortillas, and the option of soymilk and tofu (USDA: FNS, 2012).

Private Food and Nutrition Assistance Programs

To address local food needs, private food assistance programs are often supported or operated in communities by charities, nonprofit and often faith-based organizations. These locally based agencies rely heavily on volunteers to help provide food directly or indirectly to help meet the nutritional needs of America's low-income population. Emergency food programs include food banks, food pantries, soup kitchens, and emergency shelters serving clients with short-term or emergency assistance. They are designed to distribute food on a short-term or emergency basis until clients are able to meet their own needs. Food pantries and soup kitchens are the main direct providers of emergency food assistance representing 33,500 food pantries, 4,500 soup kitchens and 3,600 emergency shelters in the U.S. (Mabli et al, 2010).

Food banks are charitable organizations that solicit, receive, inventory, store and distribute donated food and grocery products to charitable agencies that directly serve needy clients. Food banks are the most important source of food for agencies with emergency food providers, accounting for 75% of the food distributed by pantries, 50% distributed by kitchens, and 41% distributed by shelters (Mabli et al, 2010).

Food banks obtain their food from a variety of sources such as the food industry, religious organizations, direct purchases from wholesalers and retailers, and the federal government through The Commodity Supplemental Food Program and the Emergency Food Assistance Program (TEFAP) (USDA: FNS, 2012). In 2009, TEFAP supplied 852 million pounds of commodities to

community emergency food providers. Over half of all food pantries and emergency kitchens received TEFAP commodities in 2000, and these commodities accounted for about 14% of all food distributed by them (Nord et al, 2010).

Food pantries, also called food shelves, traditionally distribute a limited amount of unprepared foods and other grocery products for clients to prepare and use these items where they live. Along with variation in physical pantry structure, pantries differ in types of foods available, number of people served, and hours of operation. Some food pantries distribute canned, fresh, frozen food or prepared food. In 2000, an estimated 32,737 pantries operated and distributed on average 239 million pounds of food per month. Households using food pantries received an average of 38.3 pounds of food per visit (Nord et al, 2010).

Soup kitchens, sometimes referred to as emergency kitchens or community kitchens, provide individuals with prepared food or meals, which are eaten onsite. In 2000 an estimated 5,262 soup kitchens served 474,000 meals on an average day (Nord et al, 2010).

Shelters provide shelter and serve one or more meals a day on a short-term basis to low-income clients in need. Providing shelter may be the primary or secondary purpose of the service. Examples include homeless shelters, shelters with substance abuse programs, and transitional shelters such as those for battered women (Nord et al, 2010).

Food Pantry Clientele

Food-insecure families and individuals often rely on neighborhood food

pantries for emergency food assistance. Many clients rely on emergency food assistance provided by the food pantry because they are not enrolled in public food assistance programs, their benefits have run out, or the high cost of living has stressed household food budgets beyond capacity (Algert et al, 2006). Food pantry users are considered a difficult-to-sample population, consisting of subgroups of few individuals that are difficult to identify, locate, enumerate, or interview. These include subgroups of the U.S. population who are at increased risk of adverse effects associated with poor nutritional state. Examples include pregnant women (few in number relative to the total population), migrant workers (difficult to locate), homeless individuals (difficult to locate and difficult to enumerate), and substance abusers (difficult to identify and difficult to interview). A panel of experts in research and the fields of nutrition, food security, food consumption and public policy identified nine nutritional concerns for these populations: obesity, hypercholesterolemia, hypertension, iron status, food security, drug-nutrient interactions, protein energy malnutrition, vitamin A status, and folate status as a marker for quality of diets limited in variety and quantity of foods (Anderson, 2000). Due to these factors, food pantry clients are generally characterized by high levels of food insecurity, obesity and poor diet quality (Duffy et al, 2009).

Food Pantry Numbers and Characteristics. For the past 30 years, private food assistance programs have grown in number so that nearly every community has a food pantry. The use of food pantries varies considerably by household structure, race and ethnicity. Data show that a significant number of

individuals and families—many of whom are employed— seek food assistance (Biggerstaff et al, 2002). Based on a cross-sectional study of Feeding America clients, the average monthly household income among pantry clients was 71.4% of the federal poverty level, indicating an average monthly income of \$990 (Mabli et al, 2010). In 2009, food pantry use was especially high among households with children headed by single women (13.7%), Black (8.6%) and Hispanic (7.6%) households, households with incomes below the poverty level (20%), those living in cities of metropolitan areas (5.0%) and nonmetropolitan areas (5.9%) and those living in the Midwest and West (Nord et al, 2010).

Diet Quality Assessment and U.S. Surveillance

Diet quality is complex and multidimensional as food choices are influenced not only by cost and income, but also family structure, convenience, culture, psychological factors, nutrition and food assistance programs (USDA: ERS, 2008). The role of adequate nutrition and a diet high in fruits and vegetables has been linked to reducing the risk of certain chronic diseases, such as obesity, cardiovascular disease, diabetes, and some forms of cancer (USDA, 2010). The 2010 Dietary Guidelines for Americans recommend a healthy eating pattern that emphasizes nutrient-dense foods and beverages – fruits, vegetables, whole grains, lean protein (e.g. lean meats, poultry, seafood, eggs, beans, nuts and seeds), fat-free or low-fat dairy products and limits in the intake of sodium, solid fats, added sugars, and refined grains (USDA, 2010).

However, based on nutrition surveillance of the U.S. population, most adults and children do not meet these diet recommendations, replacing nutrient-

dense foods and beverages with those too high in sodium and energy from solid fats, added sugars and refined grains (USDA, 2010). Specifically, analysis of two-day 24-hour recall data from the National Health And Nutrition Examination Survey (NHANES) 2003-2004 indicated that fewer than 1 in 10 Americans met their energy-specific fruit or vegetable recommendations (Kimmons et al, 2009). The mean intake of fruit and vegetables among Americans is estimated to be 4.7 servings per day (Guenther et al, 2006). Orange juice is the primary contributor to overall fruit intake among U.S. adults and adolescents. Legumes, dark green and orange vegetables account for a small portion of overall vegetable intake, with potatoes being the primary vegetable consumed, particularly among adolescents. When including fried potatoes, adolescent mean vegetable intake increased from 0.72 cup to 1.21 cups per day (Kimmons et al, 2009).

The USDA developed the Healthy Eating Index (HEI) to measure how well American diets correspond to recommended healthful eating patterns. The HEI is food-based and compares dietary components with USDA and Dietary Guidelines recommendations. Four components are nutrient-based for comparison to fat and saturated fat, cholesterol, and sodium and the last component assesses variety. Total HEI scores higher than 80 imply healthy diets, scores between 51 and 80 suggest improvement is needed, and scores less than 50 indicate poor diets. Using NHANES data to calculate HEI scores, Basiotis and colleagues (2004) found that individuals with incomes below 100% of poverty had a mean overall score of 61.7 with 7.0 for the variety component, as compared to respective scores of 65.0 and 8.2 in the same categories for

those with incomes above 185% poverty threshold. Thus, although the average HEI score for most Americans needs improvement, individuals from low-income households, with less education, and those between 15 to 39 years of age were most likely to have lower average scores (USDA, 1995). Increasing America's fruit and vegetable consumption is an important public health strategy for weight management and reduction of risk for chronic disease.

Food Insecurity and Diet Quality

An inadequate diet may directly compromise nutritional status, health and overall quality of life particularly among those who are food insecure. Common household responses to inadequate food supplies include food budget adjustments, reduced food intake, and alterations in types of food served.

About two-thirds of food-insecure households in 2009 avoided reductions or disruptions in food intake by relying on a few basic foods and reducing variety in their diets (Nord et al, 2010). While dietary variety decreases, consumption of energy-dense foods increases. These energy-dense foods, including refined grains, added sugars, and added saturated/trans fats, tend to be of poor nutritional quality and less expensive calorie-for-calorie than alternatives (Monsivais, 2007; Seligman et al, 2010). Consumers with limited resources may select energy-dense diets high in refined grains, added sugars and fats as an effective way to save money (Drewnowski et al, 2005). U.S. adults living in food-insecure households consume fewer weekly servings of fruits, vegetables, and dairy and lower levels of energy and micronutrients, including B vitamins, magnesium, iron, zinc, and calcium (Dixon et al, 2001; Rose et al, 1997; Tarasuk

et al, 1999). The odds of consuming intakes <50% of the Recommended Dietary Allowances (RDA) are higher for food-insecure households, particularly adult women and elderly, which places them at higher risk for nutrient deficiencies (Rose, 1999; Tarasuk et al, 1999). Poverty and food insecurity have been associated with lower food expenditures, low fruit and vegetable consumption, and lower-quality diets (Drewnoski et al, 2004).

Those living in food-insufficient families have diets that may compromise their overall health (table 2). Food-insufficient young adults had lower serum concentrations of total cholesterol, vitamin A and three other carotenoid levels. Older adults (60 years and older) from food-insufficient families had lower intake of energy (specifically cereals, salty snacks and non-alcoholic beverages), vitamin B-6, magnesium, iron, zinc and had lower serum concentrations of high-density lipoprotein (HDL) cholesterol, albumin, vitamin A, and vitamin E. Both younger and older adults from food-insufficient families were more likely to have very low serum albumin (<35g/L) (Dixon et al, 2001).

Table 2. Number of times foods were consumed during 1-mo period by younger and older adults from food-insufficient families (FIF) and food-sufficient (FSF) (Dixon et al, 2001)

Food group	Food frequency					
	Younger adults, 20–59 y			Older adults, ≥60 y		
	FIF (n = 468)	FSF (n = 6007)	P-value	FIF (n = 131)	FSF (n = 3559)	P-value
Milk and milk products	44.0 ± 1.9	51.3 ± 0.7	0.0030*	40.4 ± 5.5	49.0 ± 1.0	0.3912
Meat and meat dishes	39.1 ± 2.2	39.2 ± 0.4	0.1800	30.8 ± 2.8	33.6 ± 0.5	0.1248
Eggs and egg dishes	8.4 ± 0.6	6.2 ± 0.2	0.8545	6.4 ± 1.2	6.7 ± 0.2	0.3132
Fruits and fruit juices	32.3 ± 3.3	43.6 ± 0.6	0.0000*	52.6 ± 6.0	58.6 ± 1.0	0.6680
Citrus fruits and fruit juices	15.6 ± 1.7	18.0 ± 0.4	0.0052*	21.1 ± 2.1	23.8 ± 0.6	0.7419
Vegetables	69.1 ± 5.9	75.5 ± 0.9	0.0412*	85.1 ± 6.1	87.9 ± 1.7	0.5757
Dark green leafy vegetables	6.7 ± 1.6	7.5 ± 0.2	0.0348*	10.6 ± 1.7	7.9 ± 0.3	0.1420
Deep orange/yellow vegetables	6.7 ± 1.3	7.8 ± 0.1	0.1270	11.9 ± 1.6	10.4 ± 0.3	0.3098
White potatoes	11.5 ± 1.1	12.2 ± 0.2	0.1716	14.1 ± 1.9	12.9 ± 0.3	0.4102
Grains, legumes and snacks	86.0 ± 3.6	77.8 ± 0.8	0.9192	82.7 ± 5.3	86.1 ± 1.1	0.3336
Cereals	9.1 ± 0.8	11.2 ± 0.2	0.0747	13.1 ± 2.1	19.6 ± 0.3	0.0301*
Breads	46.3 ± 3.1	38.1 ± 0.5	0.4308	46.3 ± 3.8	43.1 ± 0.7	0.9206
Legumes	7.1 ± 0.6	4.6 ± 0.1	0.6506	8.1 ± 1.3	4.2 ± 0.1	0.0899
Salty snacks	7.0 ± 0.6	9.2 ± 0.2	0.0006*	1.4 ± 0.7	4.8 ± 0.2	0.0090*
Desserts and sweets	12.4 ± 1.2	15.4 ± 0.4	0.0232*	10.0 ± 1.9	16.4 ± 0.5	0.1963
Beverages, nonalcoholic	85.9 ± 8.3	87.5 ± 2.1	0.9877	42.4 ± 8.1	64.5 ± 1.6	0.0090*
Added fats	35.7 ± 3.5	34.6 ± 0.5	0.7570	29.6 ± 2.8	40.4 ± 0.9	0.0880

¹ Means ± SEM were calculated using the NHANES III sampling weights. Statistical significance was determined from linear regression models adjusted for gender, age, race/ethnicity, family income and region of the United States.

* P < 0.05.

Affordability and access to fresh fruits and vegetables may also contribute to poor diet quality. Dietary variety and the consumption of fresh produce are generally associated with higher food costs. Several studies have discovered that food purchases are influenced by diet costs, which act as a barrier to dietary behavior change, especially among low-income respondents (Drewnoski et al, 2004). A 1992 study of household spending on food showed that food purchases made by high-income households differed markedly from those made by low-income households (Kaufman, 1999). Wealthier households bought higher-quality meats, more fish and seafood, more fruit and vegetables, and more convenience foods. Despite buying lower-cost items, poor households devoted a far greater share of their disposable income to food.

Individuals living in rural areas or poor central cities can have poorer diet quality because of lower access to quality food stores, which carry a wider variety of more nutritious items. Such areas are referred to as food-deserts (Cummings

and Macintyre, 2002). A USDA study shows that, limited by the type and location of food stores, low-income and minority households are forced to purchase household groceries at inflated prices, especially produce (Kaufman, 1999). Such access and affordability problems result in low-income households paying more for basic nourishment compared to higher-income families.

Aside from affordability and accessibility, other contributing factors to poor diet quality include lack of nutrition knowledge and food preparation skills, and overeating when food is available (Drewnoski, 2004; Dietz, 1995; Polivy, 1996; Cummings and Macintyre, 2002).

Food Insecurity and Health Status

Recent research suggests that food insecurity may negatively impact overall health by exacerbating the onset or persistence of other adverse health conditions, including chronic disease, overweight and obesity (Cook et al, 2004, Larson et al, 2011). Food insecurity disproportionately affects children and families at the highest risk for obesity, including low-income households and members of racial/ethnic minority groups (Larson et al, 2011; Olson, 1999). As the prevalence of obesity among U.S. children and adults has reached “epidemic” levels, there is an urgent need to better understand a way to address obesity and its association with food insecurity.

Food Insecurity, Overeating, and Obesity

A tendency to overeat after food deprivation has been observed in humans dating back to the starvation study by Keys et al (1950) during World War II (Polivy, 1996). Research on eating patterns support the idea that food

deprivation can result in overeating (Olson, 1999). Polivy (1996) found that food restriction and deprivation, whether voluntary or involuntary, results in a variety of cognitive, emotional and behavioral changes such as preoccupation with food and eating. Dietz (1995) published a case study of a 7-year-old obese girl whom experienced regular monthly food shortages before her mother received the welfare check, which appeared to be a contributing factor to her weight. It was hypothesized that either food choices or physiologic adaptations in response to episodic food shortages could cause increased body fat thus leading to overweight and obesity.

The association of binge eating with dietary restraint among subgroups of obese adults may represent another example of a physiologic adaptation to periods of food surfeit and insufficiency. No studies have yet to link self-reports of restrained eating directly with actual reductions in food intake and while it is tempting to compare the regular episodic reduction in food intake by members of food-insecure households to the “yo-yo” dieting of restricted eaters, the physiologic response may differ from the response to involuntary food restriction (Dietz, 1995).

The associations between food insecurity and obesity are consistent among women, whereas the literature on children is conflicting. From a review of food insecurity literature by Larson and Story (2011), at least 20 cross-sectional and five longitudinal studies have examined whether there is a relationship between household food insecurity and weight status among U.S. children and adolescents. Six studies found evidence indicating that some groups of children

living in food-insecure households are more likely to be obese or to experience greater gains in BMI over time compared to children who are in food-secure households. However, the majority of studies either found no evidence of a direct relationship between household food insecurity and weight status or found evidence indicating that children living in food-insecure households are less likely to be obese.

Female children living in food-insecure households were likely to be influenced by parents weight status. Analysis of data from a convenience sample of 200 parents and their 212 children (aged 2-12) in Hartford, Connecticut found that food insecure adults were significantly more likely to be obese as those who were food secure (Martin et al, 2007). Being a female and having an obese parent doubled the likelihood of children being overweight, and those with a family income below 100% of poverty were half as likely to be overweight than those with higher incomes. Consistent with findings from other studies, food insecurity did not increase the odds of childhood overweight.

A few studies have further investigated whether household food insecurity may be linked to weight status in children and adolescents via influencing parental behaviors (Larson et al, 2011). The stress of food insecurity on adult members of a household may result in inconsistent parenting practices. One longitudinal study indicated that parents in food-insecure households may be less likely to adhere to recommended infant feeding practices suggesting that non-adherence (e.g., early introduction of solid foods) in food-insecure households may ultimately lead to obesity in early childhood (Larson et al, 2011).

Food insecurity and health. Household food insecurity is of great concern among children because of the implications on their health especially during development. Nationwide, food insecurity is experienced by 21% of U.S. households with children (Nord et al, 2009).

Food insecurity has been associated with inadequate intakes of several important nutrients, cognitive developmental deficits, behavioral and psychosocial dysfunction, and poor health in children (Cook et al, 2004). Children in food insecure households have a 75% greater odds of health being reported fair/poor than those in food secure households and nearly 33% greater risk of being hospitalized since birth (Cook et al, 2004). Recent research also suggests that affective or psychological stresses, such as those accompanying resource-constrained food insecurity, adversely influences child health and well-being. Not being able to purchase enough nutritious food, and the emotional or psychological stresses arising in the household, can contribute to poor health effects or exacerbate poor health including malnutrition.

Food insecurity has also been linked to developmental consequences for kindergarten children, more specifically including impaired social skill development among boys and decreased reading performance among girls (Jyoti et al, 2005). Among 6 to 12 year-old children, food insufficiency was associated with poorer mathematics scores, grade repetition, absenteeism, tardiness, visits to a psychologist, anxiety, aggression, psychosocial dysfunction, and difficulty getting along with other children (Alaimo et al, 2001; Jyoti et al, 2005). Among 15- to 16-year-old adolescents, food insufficiency, which results from resource

constraint, was associated with depressive disorders and suicide symptoms after controlling for income and other factors (Alaimo et al, 2002).

Studies examining the health effects of food insecurity among adults are generally more limited and focus on the association between food insecurity and self-reported disease. The association between food insecurity and self-reported or laboratory evidence of diet-sensitive chronic disease was examined using NHANES data (1999-2004 waves) of poor adults aged 18-65 years (Seligman et al, 2010). Food insecurity was associated with hypertension and diabetes, indicating that food insecurity is linked to cardiovascular risk factors.

Does Participation in Food Assistance Programs Alleviate Food Insecurity?

The relationship between food security and the use of food and nutrition assistance programs is complex. Since the programs provide food and other resources to reduce the severity of low-income households' food insecurity, one would assume that households using food assistance programs would be more food secure than those not using the programs. However, it may be that those households who seek food assistance are more at risk and have the lowest level of food security that may not be alleviated with the food assistance participation. Since program participation is elective, it is difficult to determine the effects of the program to alleviate food insecurity against the selection effects on the choice to participate.

In 2010, 52% percent of households who received SNAP benefits, 48% who received free or reduced-cost school lunches, and 46% who received WIC benefits were food insecure (Coleman-Jensen et al, 2011). The prevalence of

very low food security among households participating in SNAP was 8.8 percentage points higher than that of nonparticipating households in the same low-income range (20.1% versus 11.3%). For households who received free or reduced-cost school lunches, the prevalence of very low food security was more than twice that of nonparticipating households with school-age children in the same income range (15.6% versus 7.5%).

As of 2011, one in seven Americans received SNAP benefits (USDA: ERS, 2011; FRAC, 2010). Slightly over half (50.8%) of all Americans between the ages of 20 and 65 will at some point receive SNAP benefits. Based on the life course patterns of SNAP use, it is estimated that at least 42% of the American population will experience food insecurity at some point between the ages of 20 and 65 (Rank et al, 2005). Use of the program takes place over relatively short periods of time but typically recurs at several points throughout the life course. Race and education have a strong influence on the odds of program participation. Those who had less than 12 years of education and were African American were more likely to participate.

Similar to the National School Lunch Program, the School Breakfast Program offers breakfast to low-income children at no cost or a reduced price. Enrollment in the program has been linked to positive changes in meal patterns and nutritional outcomes, which may increase household food security. Bartfield and Ahn (2011) examined the relationship between availability of the School Breakfast Program and household food security among low-income third-grade students using data from the Early Childhood Longitudinal Survey-Kindergarten

Cohort (n = 3010). Access to school breakfast reduced the risk of marginal food insecurity by offsetting food-related concerns among at-risk families, but in alleviating the risk of food insecurity once hardships had crossed the food insecurity threshold. Increasing the availability of school breakfast may be an effective strategy to help maintain food security among low-income households with elementary school children.

Participation in Food and Nutrition Assistance Programs on Health

As national survey data indicate that food insecurity disproportionately affects populations at the highest risk for obesity, the relationship between food assistance programs on food insecurity and weight status is of great interest. Several studies have examined whether there is a relationship between participation in SNAP and weight status in children and adults (Larson et al, 2011). It was found that long-term receipt of SNAP benefits is related to having a higher BMI among certain groups (girls aged 12 years, young daughters of obese mothers, those with family incomes at or below 130% poverty, and preschool children living in cities with high food prices). Although many factors are likely to influence the relationship between SNAP benefits and child BMI, this study accounted for participation in other public food assistance programs, family structure, maternal education, maternal employment, mother's BMI, the household's income-to-poverty ratio, and food insecurity (Larson et al, 2011).

SNAP may play a role in the relationship between food insecurity and obesity according to analysis of a nationally representative sample of 20,922 women collected between 1981 and 2002. The BMI of a typical woman

participating in SNAP was more than one unit higher than the BMI of someone with the same socioeconomic characteristics who was not in the program. The duration of participation had a cumulative impact on BMI; longer periods of SNAP participation were associated with greater increases in BMI (Larson et al, 2011).

SNAP participation may benefit non-nutritional outcomes, specifically academic learning, among school-aged children. Data from the Early Childhood Longitudinal Study-Kindergarten cohort, a large nationally representative sample, was used to determine whether SNAP participation was associated with child reading and mathematics learning, weight gain and social skills (Frongillo et al, 2006). Starting SNAP participation in the four years between preschool and third grade was associated with a 3-point increase in reading and mathematics score, most significantly among female students, and tended to be associated with less weight gain, compared to children living in households who stop SNAP participation during that same period. These findings were consistent with other studies and indicated that SNAP participation was associated with either lower or equal risk of overweight children (e.g., Jones et al, 2003).

When comparing differences among women living in WIC households to those participating in WIC and the Farmer's Market Nutrition Program, Kropf and colleagues (2007) found that WIC/Farmers' Market Nutrition Program participants reported greater daily intake of vegetables and more indicators of a healthful diet, but did not appear to be more food secure. Both perceived benefit of the program and perceived diet quality was greater for Farmers' Market Nutrition Program (Kropf et al, 2007).

Food Panty Clients and Barriers to Federal Food Assistance Program Participation

Food pantry users represent a group at highest risk for being food insecure and therefore can benefit from participation in SNAP and other federal food assistance programs. Most food pantry clients are eligible to receive SNAP benefits because of low household income, but a substantial number are not enrolled. Nationally, approximately one in four people eligible for the SNAP are not receiving benefits, according to USDA (USDA: ERS, 2011; FRAC, 2010). To gain insight for SNAP outreach programs, background characteristics of food pantry users in Los Angeles (n =14317) were analyzed. Ninety percent of food pantry users were living well below poverty level, 59% were Hispanic, and 44% were homeless (Algert et al, 2006). However, only 15% of the food pantry clients received SNAP, with homelessness and limited English language skills acting as barriers to SNAP participation. Additional circumstances for enrolling for SNAP benefits included lack of permanent address for homeless individuals and undocumented immigrants. Children of undocumented immigrants born in the U.S. are eligible to receive food stamps and can be enrolled through additional outreach efforts.

Little research is available on food pantry users in Connecticut. However, a cross-sectional retrospective study of low-income households (below 185% of poverty) helped to identify barriers for lack of participating in public (SNAP) and private (food pantries and soup kitchens) food assistance programs (Martin et al, 2003). Of 330 randomly selected low-income Hartford households, researchers found that over one-third of respondents did not participate in any food

assistance programs, while the majority received SNAP alone or received SNAP and utilized food pantries. Those who utilized food pantries went on average 4 times in the previous year. Black and elderly households were less than half as likely to receive SNAP compared to Hispanic and non-elderly households.

Barriers for not participating in SNAP included “believing their family was not eligible,” “difficulty with applying,” or they “applied but were found ineligible.” The main reasons against food pantry and soup kitchen were that they “don’t need the food,” “feel uncomfortable using the program,” “have no transportation,” “don’t know where the program is located,” or “have difficulty carrying the food home from the pantry” (Martin et al, 2003). Additional research is needed to understand what types of interventions can help to increase participation rates, especially in Hispanic and elderly households. Outreach for food stamps and private food assistance programs should accommodate these differences so that food-insecure households can benefit from all available food assistance programs.

Food Pantry Clients’ Access to Food

Food pantries are a type of private emergency food assistance focusing on providing short-term assistance to low-income households with packages of food items that generally require additional preparation. There is high variability in food offered at pantries because the sources of food vary among food banks, farms, retail store salvage, individual donations, and direct purchases (Akobundu et al, 2004). Donations to food pantries is motivated by a variety of underlying factors. The major factor is the knowledge that there were hungry people in the community in need of food and the feeling that contributing food was the right

thing to do to solve local hunger problems. In-depth focus groups revealed that many donors did not consciously consider nutrition when deciding which foods to donate (Verpy et al, 2003). Others indicated that they tended to rely on the food shelf operators to request nutritious foods or to buy the foods that people needed. Some indicated that they knew some products were not nutritious but wanted to provide "treats" for children such as cookies, chips, candy, or cereal high in sugar.

Most food pantries distribute, on average, foods that meet or exceed recommended dietary levels for 3-days consisting mainly of perishable food items with limited variety of fresh fruits and vegetables. The occasional donation of single fruit or vegetables are limited and distributed quickly due to quick spoilage, leaving clients with only a small volume of canned or frozen fruits and vegetables at each visit (Algert et al, 2006).

Food donations may not match client needs for people with different ethnic backgrounds or age groups and food safety concerns (Verpy et al, 2003). These feelings were identified with in-depth focus groups with pantry clients and food donors conducted to obtain information regarding attitudes and beliefs of individuals who donate food and perceptions of needs among food shelf clients. Four major themes were identified from pantry users including (1) the need for food choice, (2) concern regarding the safety and quality of the food provided, (3) the need for nonfood items, and (4) thoughts on how the food shelves might improve services for clients. Food types desired by pantry users included fresh dairy products (not powdered), more meat products (fresh, frozen, or canned),

more fresh and seasonal vegetables and fruits, increased variety of vegetables, and coordinated meal items (e.g., a staple to coordinate with a meat or vegetable item or a meat to coordinate with a staple or vegetable item).

Food pantry clients, many living in poor ethnic neighborhoods, are at highest risk for inadequate intake of fruits and vegetables as emergency food assistance often does not include a supply of fresh produce (Algert et al, 2006). Because low-income and minority families are less likely to meet recommended intake for selected nutrients or food groups, the type of food acquired from the emergency food system is important (Verpy et al, 2003).

Algert et al (2006) examined the distance that food pantry clients (n = 3,985) live within reasonable walking distance (0.8 km network buffer) of stores (n = 84) carrying fresh produce in Pomona, California. Food stores were categorized as selling a “variety of produce” or “limited produce” using geographic information systems technology. Forty-one percent of food pantry clients were within walking distance of a store with a variety of fresh produce, 83% were within walking distance of stores with limited produce, 13% were not within walking distance of either store type.

Diet Quality in Food Pantries

Despite the large quantity of food distributed, little is known about the nutritional quality of foods distributed from pantries. Akobundu et al (2004) examined the nutrient value and food group content of food items given to 133 clients using 19 pantry sites in Western Massachusetts. Using the USDA’s Food Guide Pyramid, approximately one bag contained sufficient grains to last 7 days,

vegetable and meat/protein to last 5 days, and fruit and milk products to last only 3 days. The majority of servings came from fats, oils and sweets, followed by grains (e.g., bread, cereal, rice, pasta). Fruit and dairy products (e.g., milk, yogurt, cheese) were among the least available. Pantry foods distributed were of adequate or high nutrient density for protein, fiber, iron, and folate, yet were lacking nutrient density for calcium, vitamin A, and vitamin C (Akobundu et al, 2004). Findings indicate the need for creative efforts for pantries to procure, store, and distribute additional fruit, dairy products, and other sources of vitamins A and C and calcium.

Food insecurity is associated with higher BMI and overall poor diet quality. Among 55 female food pantry clients (19-50 years of age) in Lee County, Alabama, 65% were food insecure, 67% were obese and diet quality was generally poor (HEI of a 43 out of 100). The majority of women reported no consumption of fruit/whole fruit, whole grains, dark green/orange vegetables or legumes. The maximum score received was for the meat and beans category. Low overall diet quality was associated with having low education levels (less than a high school degree) and being a smoker (Duffy et al, 2009).

Freshplace Food Pantry Intervention

The Freshplace food pantry resulted after several years of planning and the combined support of three community-based organizations—Chrysalis Center, Junior League of Hartford and Foodshare. Freshplace is located within the Chrysalis Center, which is a private, non-profit healthcare agency that provides support services to people with psychiatric disabilities, substance abuse

issues, and/or HIV/AIDS. The Chrysalis Center provides funds to support staffing of a paid Project Manager and coordinates multiple volunteers who support the program. The Junior League of Hartford is an organization of women committed to promoting voluntarism and improving communities through effective action and leadership of trained volunteers. The League has agreed to provide volunteer staff to support Freshplace by stocking pantry shelves, assisting clients with selecting food and supporting the Program Manager for up to five years. Foodshare is the regional food bank of Greater Hartford, which collects, warehouses and distributes food to serve food pantries, soup kitchens, and shelters in Hartford and Tolland counties. Foodshare agreed to provide all food products to Freshplace for 3 years, 90% of which would be fresh fruit, vegetables, dairy and meats.

People who attend Freshplace are called members rather than clients. Freshplace is a client-choice pantry meaning that members are able to make their own food selection as they would in a grocery store, as opposed to traditional food pantries, which provide pre-packaged grocery bags. Food items are arranged by categories (meat, dairy, produce, dried/canned) and members walk through with a volunteer and select items based on family size. This model allows for clients to handle the food and look at nutrition labels just as if they were shopping in a store. Freshplace is open three days per week, on Tuesdays, Thursdays and Saturdays. As an entry-point to Freshplace, members have access to fresh food at the pantry once every two weeks. All members meet with the Project Manager to create a *Freshstart Service Plan*, which identifies and

monitors goals, expectations and potential barriers for becoming food secure and self-sufficient. This involves developing concrete target behaviors with small achievable goals to be reached by the next month. At each monthly meeting, goals are discussed and member's progress is monitored.

To help meet their goals, Freshplace offers an array of services and referrals tailored to address individual needs of each client by collaborating with community partners and existing programs. Examples of these services include nutrition education, budget coaching and money management, and referrals to social services, General Educational Development (GED) classes, job training and determination of eligibility for federal food assistance programs such as SNAP, WIC, and free-reduced price school meals. When applicable these services are provided on-site at Freshplace.

Nutrition Education at Freshplace. Along with the availability of healthy food options at Freshplace, members are offered various nutrition education opportunities. Participants are able to participate in a 6-week nutrition and culinary series provided by Share Our Strength called *Cooking Matters for Adults* (Share Our Strength, n.d.). The course teaches low-income adults how to prepare and shop sensibly for healthy meals on a limited budget. The program was offered at Freshplace two times (Fall/Spring) with 25 total Freshplace participants. In the two-hour class, one hour is focused on nutrition education and the second hour is devoted to cooking three recipes and sharing a meal together. This program served to increase the knowledge, skills, behaviors and confidence of Freshplace members.

In addition, undergraduate Department of Allied Health Sciences dietetic students and dietetic interns from the University of Connecticut provided nutrition education resources to Freshplace members. Students tabled dietary handouts, healthy recipes, and samples and were available for individualized nutrition—related questions periodically as experience in community nutrition.

The Freshplace intervention is formed around the social cognitive theory (SCT), which posits that in order to achieve behavior change people go through stages. It specifies a core set of determinants, the process in which they work, and how to translate knowledge of health promotion and disease prevention into effective health practices. *Self-efficacy* is the idea that one can exercise control over their own health habits and is key to motivation and action (Bandura, 2004). In gaining a better self-control over his/her lifestyle and health habits, members will utilize knowledge and skills to increase their food security and self-sufficiency. Other core determinants of SCT are the health goals people set for themselves, the concrete plans and strategies for acknowledging them, and the social and structural impediments to the changes they seek (Bandura, 2004). The emphasis of the Freshplace program is to help members set small achievable goals for behavior change that if accomplished could boost their confidence in coping with similar problems in the future (Martin, 2009).

Summary

This literature review highlights the need to examine associations between food security, food assistance participation, obesity and diet quality among food pantry clients, particularly in Connecticut. As a new food pantry model, the

Freshplace program provides an opportunity to compare members who go to Freshplace with clients who go to traditional food pantries. Results can be compared to this previous literature. This thesis will examine the following research questions with specific hypotheses.

Research Questions

How is food insecurity related to diet quality and participation in food assistance programs among Freshplace clients and control group at baseline?

Is participation in Freshplace across 3 months associated with food security, diet quality and participation in SNAP?

Hypothesis

H1: Food insecurity will be associated with lower diet quality and participation in private (food pantry and soup kitchen) food assistance programs.

H2: Three months of participation in Freshplace will be associated with improved food security and participation in SNAP.

H3: Three months of participation in Freshplace will be associated with improved diet quality, measured by increased intake of fruits and vegetables.

METHODS

The data used for this thesis are part of a larger, 18-month randomized control study to evaluate Freshplace that is lead by principal investigator, Dr. Katie Martin, and her research team at the University of Connecticut. The 100 clients who participate in the Freshplace program and 100 clients who utilize traditional food pantries in Hartford's North End were studied with surveys at baseline and then repeated at 3, 6, 9, 12, 15 and 18 months. The survey data used for this thesis was collected at baseline and 3 months follow-up. The University of Connecticut Health Center's Institutional Review Board (IRB) approved the study protocol.

Setting and Participants. Study participants were recruited from two local food pantries serving residents of the Upper Albany neighborhood of Hartford. Both pantries operate on different days of the week at different times. One pantry was open from 8-10am each Tuesday and Friday, while the other pantry was open from 4:30-6:30pm on Thursdays. The Research Team visited each pantry on different days and times of the week to obtain a representative sample.

Study Recruitment. To be eligible for the study, participants must be over 18 years old, live in one of three Hartford zip codes (06105, 06112, 06120), speak English, receive food from a Hartford food pantry, and be the only study participant in their household. As determined by the Research Team, participants were considered to be in the same household if they contribute to the same food budget, which indicates that they share a food supply and prepare meals

together. Researchers approached participants as they arrived at the pantry to briefly explain the study. They were informed that they were being invited to participate in a study about how food pantries help people get enough food, commitment was required for up to one year, the decision to participate is voluntary and they have a right to discontinue participation. If a pantry user lacked interest in participation, researchers continued recruitment until someone agreed to enroll. If a pantry user decided to participate, researchers read through the consent form and received participant's signature. To protect participant confidentiality, participants were assigned a unique identification number (ID), which was used for all data collection and data entry. Upon recruitment and collection of baseline survey data, participants blindly selected one of two colored balls from a bag indicating either Freshplace (red) or Comparison group (blue). Participants randomized to Freshplace were invited to go to Freshplace and were given a scheduled appointment with the Program Manager. Participants randomized to the Comparison group would continue to receive food from traditional food pantries. Participants were paid \$10 after baseline collection and \$5 at the 3-month follow-up collection.

A total of 226 participants were recruited into the study and data collection for this research was conducted from June 2010 to July 2011.

Survey Instruments

All data were collected in-person at the food pantry or at Freshplace using interviewer-administered surveys. Survey sections included demographic

information, food insecurity, diet intake, and health including body mass index (BMI) (See Appendix 2).

Demographic information included household size, number of children, age, ethnicity and gender. The survey responses were numeric (e.g., age), categorical (e.g., ethnicity, Black, West Indian, Hispanic, other) and dichotomous (yes, no). The survey took approximately 25-35 minutes to complete and was administered by research assistants, including this student, and the Principal Investigator of the Freshplace evaluation, Dr. Katie Martin. To ensure consistency in survey administration, a training session was held by the researchers prior to the start of interviewing.

Food Security—Household food security was measured using the gold standard 18-item USDA Household Food Security Module screener. As described in the introduction, this module consists of 18 questions about experiences and behaviors related to food insecurity that proceed based on the severity of a household's experiences with food insufficiency during the last 3 months. Three items regarding household food insecurity were asked of all respondents. If the respondent had children, they would proceed to questions about child and household measures. If the respondent did not have children and answered, "sometimes or often true" to any of the three, they would proceed to another 5 questions regarding adult and household measures. If respondent answered, "never true" to all 3 questions, the food insecurity section was completed and the interviewer would skip to the next section. Households without children have a total sum of 10 possible affirmative responses, and

households with children have a possible total of 18 responses. For households without children, the adult measures equal the household measure (USDA, 2011). Based on the food security scoring module (see Table 3), food security status was categorized as 1. high food security, 2. marginal food security, 3. low food security, 4. very low food security. For some analyses, food security status was condensed into a dichotomous variable as food secure (high food security and marginal food security) and food insecure (low food security and very low food security), based on USDA standards.

Table 3. Food Security Scoring Module

Number of Affirmative Responses		Food Security Status
Households with no children (Raw Score out of 10)	Households with one or more children (Raw Score out of 18)	USDA Category
0	0	High food security
1-2	1-2	Marginal food security
3-5	3-7	Low food security
6-10	8-18	Very low food security

Food Assistance Participation—To determine participation in food assistance programs, participants were asked, “Which of the following has your family used to get food in the past 3 months?” Programs included soup kitchens, food pantries, SNAP, WIC, free/reduced price school meal, Earned Income Tax Credit, Energy Assistance/Rent Rebate, and “other” category. For all the “yes” answers, the frequency (e.g. times visited each week/month) and amount (e.g., number of pantries utilized each week/month) of use was determined.

Dietary Quality—The Block Food Frequency Screener, a validated tool for measuring usual dietary nutrient intake over one-month, was used to assess diet

quality (Block et al, 2009). This screener has been proven to provide nutrient estimates that correlate with the “gold standard” 1995 Block 100-item Food Frequency Questionnaire and more extensive methods, such as multi-day food intakes (Block et al, 2000). This present study utilized both the Block Fruit/Vegetable/Fiber and Block Dietary Fat Screener (NutritionQuest, 2009). Portion sizes are not asked. The screener used is a one-page tool that is comprised of two sections, Fruit/Vegetable and Meat/Snacks.

The Fruit/Vegetable section included 7 questions about fruit and vegetable intake and 3 questions related to fiber intake (e.g., brown rice, whole grain cereals and bread). This section was designed to assess individual’s usual fruit, vegetable, and fiber intake. Participants were asked to think about the foods they ate in the last month for breakfast, lunch, dinner, snacks and eating out and respond to how often they ate different items using response categories of: less than once a week, once a week, 2-3 times a week, 4-6 times per week, once a day and two or more times a day. The responses were scored 0, 1, 2, 3, 4, 5 and when fruit and vegetable intake was examined alone, possible scores ranged from 0 to 35. A score of 0-10 correlated with less than 3 servings of fruits and vegetables a day, indicating very low amounts of micronutrients. A score of 11-12 correlated with less than four servings per day. A score of 13-15 correlated with less than 5 servings per day, indicating a healthy diet but still consisting of less than recommended servings. A score of 16 or above correlated with five or more servings, which is consistent with several national guidelines.

The Meat/Snacks section is comprised of 17 items designed to capture

dietary fats, dairy and snack items. This section was designed to assess individual's usual fat intake. Participants were asked to think about the foods they ate in the last month for breakfast, lunch, dinner, snacks and eating out and respond to how often they ate different items using response categories of: once a month or less, 1-2 times a month, 3-4 times a week, or 5 or more times a week. Categories were scored 0, 1, 2, 3, 4 and ranged from 0-60. Scores of 0-7 indicated "very low fat" intake and 8-14 indicated a "moderate fat" intake, approximately 30-35% of total calories. A score of 15-22 indicated a "high fat" diet and a score of 23 indicated a diet "very high" in fat intake, approximately 40-50% of calories. Portion sizes were not asked for either section (Block et al, 2000).

Self-Reported Health and BMI—To determine BMI, height was measured at baseline using a Stadiometer (Seca 213) and weight was measured at each survey using a digital medical scale (Healthometer). Data were collected by researchers in pounds and feet, therefore, body mass index was computed as follows: $[\text{weight (lb)}/\text{height (in)}^2] \times 703$. Once calculated, BMI was classified according to the CDC criteria: BMI of less than 18.5 indicated underweight, 18.5 to 24.9 indicated normal weight, 25 to 29.9 indicated overweight, 30 and 40 indicated obesity, and >40 indicated morbidly obesity (CDC, 2011). Participants were asked to rate their overall health on a scale of 1-5 (1 being excellent, 5 being poor). Participants were also asked if a doctor ever told them or someone in their household that they have diabetes or high blood pressure.

Statistical Analysis

The survey cover sheet, which included participants' contact information and member number was entered manually into an Access Database. Once entered, all survey data was electronically entered into a Microsoft Excel file. Analyses were conducted using PASW (SPSS) Version 18.0. Descriptive statistics (frequencies) were used to describe the total sample of food pantry participants. Bivariate associations among food security measures and categorical or dichotomous variables were analyzed using χ^2 tests and Fishers Exact Test for small expected cell counts (less than 5). Baseline measures and the average change in baseline to 3 months follow-up measures in intervention versus control group was compared (i.e., 3 month baseline score – baseline score) and analyzed using independent samples t-tests.

Prediction equations for daily nutrient intake based on food screener scores, sex, age, and race were used to estimate total fat, saturated fat, dietary cholesterol, fruit/vegetable servings, dietary fiber, vitamin C, magnesium, and potassium as shown in table 4 (Block, Gillespie, Rosenbaum, Jenson, 2000). Daily nutrient intakes were compared to the recommendations set by the Dietary Guidelines for Americans 2010 which are intended for Americans 2 years and older including those who are at risk for chronic diseases (USDA, 2010).

Table 4. Predictive Equations for Daily Nutrient Intake Based on Food Screener Scores (Block et al, 2009)

Nutrient	Equation
Total Fat (g)	$= 32.7 + 2.4 (\text{Meat/Snack Score}) + 11.2 S$
Saturated Fat (g)	$= 9.4 + 0.88 (\text{Meat/Snack Score}) - 3.5 S$
Dietary Cholesterol (g)	$= 120 + 7.8 (\text{Meat/Snack Score}) - 54.65 S + 36.6 R$
Dietary Fiber (g)	$= 7.9 + 0.74 (\text{Fruit/Vegetable/Beans Score}) - 4.5 S$
Vitamin C (mg)	$= 56.5 + 6.6 (\text{Fruit/Vegetable/Beans Score}) - 26.7 S - 0.45 A$
Magnesium (mg)	$= 272 + 11.6 (\text{Fruit/Vegetable/Beans Score}) - 92.3 S - 1.7 A$
Potassium (mg)	$= 2348 + 114.8 (\text{Fruit/Vegetable/Beans Score}) - 759 S - 13.8 A$

S = Sex: Male = 0, Female = 1

R = Race: White = 0, Nonwhite = 1

A = Age: Actual age directly substituted for the A variable

RESULTS

Sample Characteristics at Baseline

A total of 226 surveys were completed at baseline and 110 surveys completed at 3 months follow-up. Of the total 226 participants, 112 (49.6%) were randomized into Freshplace and 114 (50.4%) were part of the Control group. Sample characteristics of Freshplace and Control groups are displayed in Table 5. The majority of food pantry users were between the ages of 30-64 years, with a mean age of 52 years for both men and women. Food pantry participants were predominately Black, followed by West Indian, female and single. Food pantry participants had limited education, employment and transportation. The majority (87.2%) of food pantry participants had less than a college degree. Only 20.4% of food pantry participants were employed at the time of their baseline interview. Approximately 80% did not own a car.

The average household size of food pantry participants was three members, with 16.4% having children age five and under, and 34.4% having children between the ages of 6-17. There was a significant difference ($p = .05$) in the distribution of household size; Freshplace participants were relatively evenly distributed across the household size categories whereas the Control participants were distributed toward smaller household sizes. Approximately 83% of food pantry users had some form of health insurance for some adults (8.8%), children and adults (16.4%) or everyone (58.4%) in the household.

Table 5. Frequency Characteristics of Sample Population

	Control		Freshplace		P Value
Characteristic	N	%	N	%	
Total Sample	114	100	112	100	
Gender					
Male	48	42.1	44	39.3	.67
Female	66	57.9	68	60.7	
Age					
18-50	50	44.2	53	48.2	.53
50+	63	55.8	57	51.8	
Race					
Black	84	74.3	81	72.3	.89
West Indian	20	17.7	21	18.8	
Hispanic/mixed	7	8.0	9	8.1	
Education					
< High school degree	50	43.9	49	43.8	.17
High school/ GED	45	39.5	52	47.3	
Some College, Associates, BA/BS degree	19	16.7	10	8.9	
Marital Status					
Single	70	61.4	66	58.9	.46
Married/living with Partner	20	17.5	21	18.8	
Separated/divorced/widowed	24	21.2	25	22.4	
Employment Status					
Employed	25	21.9	21	18.8	.75
Unemployed/retired	75	65.8	79	70.5	
Household Size					
1	34	29.8	20	17.9	.05
2	32	28.1	25	22.3	
3	24	21.1	25	22.3	
4	13	11.4	20	17.9	
5+	11	9.6	22	19.6	
Own a Car					
Yes	21	18.4	26	23.2	.38
No	93	81.6	86	76.8	

Food Security Status at Baseline

As shown in Table 6, 85% of food pantry participants were food insecure (low or very low food security) and only 15% were food secure (high or marginal

food security) at baseline. Of those considered food insecure, about one third were experiencing low food security and half were experiencing very low food security (food insecurity with hunger). Of households considered food secure, 7.5% responded positively to one or two of the food insecurity indicators, demonstrating marginal food security, or some worries or difficulties in obtaining enough food. These results are the reverse for the 2010 U.S. rates of food security status (Figure 1).

Five forms of food assistance programs (2 private and 3 public) were inquired about during the interview. The majority utilized food pantries once a week or more each week (62.9%). Those using food pantries went to an average of three pantries each month, while some reported visiting 5 to 8 different pantries (results not shown). Approximately 43% of all participants reported using a soup kitchen to obtain a meal. Over a third (36.1%) of those using a soup kitchen went 2-4x/week and 11.3% reported going on a daily basis. As anticipated, the most used federal food assistance program was SNAP, with 58.5% enrolled at baseline. Of 37 households eligible for WIC, those having children 5 years or under, only 2 were enrolled. Of the 45 households eligible to receive free/reduced price school meals, those with children 6-17 years of age, 15 households were not enrolled. There was a significant difference ($p = .01$) in food pantry use between Freshplace and the Control group at baseline; participants of Freshplace were more less likely to go to food pantries once per week or more, whereas Control participants were more likely to report once per week or more (71.1% versus 54.4%).

Table 6. Frequency of Food Security and Food Assistance Use

	Control		Freshplace		P Value
Characteristic	N	%	N	%	
Total Sample	114	100	112	100	
Food Security Status					
Food secure	16	14.0	18	16.1	.67
Food insecure	98	86.0	94	83.9	
Food Pantry Use					
Less than weekly	33	28.9	51	45.5	.01
Once per week or more	81	71.1	61	54.4	
Soup Kitchen Use					
Less than weekly	13	28.9	15	30.6	.86
Once per week of more	32	71.1	34	69.4	
Food Assistance Use					
SNAP	70	61.4	35	59.3	.43
WIC	1	.9	1	.9	1.0
Free/reduced price school meals	26	22.8	28	25.0	.99

Diet Quality at Baseline

The frequencies for Freshplace and the Control for diet quality measures based on Block Food Screener scores are shown in table 7. There were no significant differences for diet quality categories at baseline between the two groups. On average, pantry users consumed less than four servings of fruits and vegetables each day. Nearly half (47.3%) consumed less than 3 servings/day and five pantry users had a fruit/vegetable score of 0. These servings compare unfavorably to the Dietary Guidelines for Americans recommendation of five to nine servings of fruits and vegetables per day. Assuming that each fruit or vegetable consumed was a standard serving, only about 20% of all pantry users had scores indicating they were meeting the recommended levels (5 servings per day). Approximately 85% of all pantry users consume a diet that is considered high or very high in fat. The mean meat/snack score was 27.17 indicating a “very

high” fat intake among this population (table 8). One participant scored a 67, which was the maximum range.

Table 7. Frequency of Dietary Intake by Dietary Quality Categories among Food Pantry Participants (Control) and Freshplace Food Pantry

	Control		Freshplace		P Value
Characteristic	N	%	N	%	
Total Sample	114	100	112	100	
Fruit and Vegetable Score					
< 5 servings per day (0-15)	92	80.7	89	79.5	.81
5 or more servings per day (16+)	22	19.3	23	20.5	
Meat and Snack Score					
Low/ Moderate fat intake (0-14)	19	17.0	14	12.6	.36
High/ Very high fat intake (15- 23+)	93	83.0	97	87.4	
Daily Nutrient Intake*					
Total Fat (g/day)					
Desirable (≤ 65)	9	8.2	6	5.5	.42
Above Desirable (> 65)	101	91.8	104	94.5	
Saturated Fat (g/day)					
Desirable (< 20)	14	13.0	12	11.1	.68
Above Desirable (≥ 20)	94	87.0	96	88.9	
Dietary Cholesterol (g/day)					
Desirable (< 300)	61	54.5	55	50.0	.51
Above Desirable (≥ 300)	51	45.5	55	50.0	
Dietary Fiber (g/day)					
Below Desirable (< 25)	111	97.4	107	98.2	1.0
Desirable (≥ 25)	3	2.6	2	1.8	
Vitamin C (mg/day)					
Below Desirable (< 75)	30	29.1	35	36.5	.27
Desirable (≥ 75)	73	70.9	61	63.5	
Magnesium (mg/day)					
Below Desirable (< 420)	111	97.4	104	92.9	.13
Desirable (≥ 420)	3	2.6	8	7.1	
Potassium (mg/day)					
Below Desirable ($< 4,700$)	113	99.1	112	100	1.0
Desirable ($\geq 4,700$)	1	.9	0	0.0	

*Based on a 2,000 calorie diet for individuals aged 31-50

Mean Intake Diet Score. The mean intake scores for diet quality measures in the total sample at baseline are shown in table 8. Overall findings

showed that food pantry users had diets high in total fat (mean 104.5 g/day) and saturated fat (mean 31.2 g/day); low in dietary fiber (mean of 14.5 g/day), magnesium (mean of 274 mg/day), and potassium (mean of 2,618 mg/day); and sufficient in vitamin C (mean of 100 g/day). Approximately half of participants (52.3%) were within desirable intake and 47.8% were above desirable intake for daily cholesterol.

Table 8. Mean Intake Diet Quality Measures for Total Sample At Baseline

Characteristic	Total Sample Mean N = 226
Fruit and Vegetable Score	11.2
Meat and Snack Score	26.5
Daily Nutrient Intake*	
Total Fat (≤ 65 g/day)	103.9
Saturated Fat (< 20 g/day)	30.4
Dietary Cholesterol (< 300 g/day)	291.1
Dietary Fiber (≥ 25 g/day)	14.3
Vitamin C (≥ 75 mg/day)	98.7
Magnesium (≥ 420 mg/day)	267.3
Potassium ($\geq 4,700$ mg/day)	1824.4

*Recommended amounts in parentheses based on a 2,000 calorie diet for individuals aged 31-50

Weight Status at Baseline

No significant differences were found for weight and self-reported health status at baseline between the two groups (table 9). Seventy percent of food pantry participants had a BMI indicating overweight/obese, 26% were classified as normal weight and 3.6% (n = 6) were considered underweight. A quarter of food pantry participants reported having been told by a doctor that they or someone in their household has diabetes and 66% with high blood pressure. Food pantry participants tended to report their overall health as good or fair

(70.4%). Less than a quarter (21.9%) of food pantry participants considered their health as excellent or very good.

Table 9. Frequency of Weight and Self-Reported Health Status

Characteristic	Control		Freshplace		P Value
	N	%	N	%	
Total Sample	114	100	112	100	
BMI Classification					
Normal weight	8	17.4	9	19.6	.81
Overweight	18	39.1	15	32.6	
Obese/ Very obese	20	43.5	22	47.8	
Diabetes					
Yes	86	75.4	30	26.8	.70
No	28	24.6	82	73.2	
High Blood Pressure					
Yes	71	62.3	76	67.9	.38
No	43	37.7	36	32.1	
Self-Report Health Status					
Excellent/very good	12	20.0	13	23.6	.64
Good/fair/poor	48	80.0	42	76.4	

Food Security Associations at Baseline

To understand how food insecurity relates to diet quality and participation in food assistance programs, bivariate associations between food security and demographics, food assistance and diet quality were assessed (table 10). For these analyses, food security status was dichotomized into two categories, food secure and food insecure. Food secure individuals had a greater number who reported consuming five fruits and vegetables per day ($p = .05$), yet there were still only about 1/3 of food security individuals who did so. Interestingly food insecure individuals tended to be more likely to consume adequate intakes of vitamin C ($p = .06$). No significant differences were found for demographic characteristics, food assistance participation or BMI.

Table 10. Dietary Intake at Baseline by Food Security Status

Characteristic	Food Secure N= 34	Food Insecure N = 192	P Value
Fruit and Vegetable Score < 5 servings per day (0-15) 5 or more servings per day (16+)	23 (67.6%) 11 (32.4%)	158 (82.3%) 34 (17.7%)	.05
Meat and Snack Score Low/ Moderate fat intake (0-14) High/ Very high fat intake (15- 23+)	2 (6.3%) 30 (93.8%)	31 (16.5%) 157 (83.5%)	.18
Daily Nutrient Intake* Total Fat (g/day) Desirable (≤ 65) Above Desirable (> 65) Saturated Fat (g/day) Desirable (< 20) Above Desirable (≥ 20) Dietary Cholesterol (g/day) Desirable (< 300) Above Desirable (≥ 300) Dietary Fiber (g/day) Below Desirable (< 25) Desirable (≥ 25) Vitamin C (mg/day) Below Desirable (< 75) Desirable (≥ 75) Magnesium (mg/day) Below Desirable (< 420) Desirable (≥ 420) Potassium (mg/day) Below Desirable ($< 4,700$) Desirable ($\geq 4,700$)	 1 (3.0%) 32 (97.0%) 1 (3.1%) 31 (96.9%) 17 (53.1%) 15 (46.9%) 0 (0.0%) 34 (100.0%) 24 (82.8%) 5 (17.2%) 1 (2.9%) 33 (97.1%) 0 (0.0%) 34 (100%)	 14 (7.5%) 173 (92.5%) 25 (13.6%) 159 (86.4%) 99 (52.1%) 91 (47.9%) 5 (2.6%) 184 (97.4%) 110 (64.7%) 60 (35.3%) 10 (5.2%) 182 (94.8%) 1 (.5%) 191 (99.5%)	 .71 .14 .91 1.0 .06 1.0 1.0
BMI Classification Under/normal weight Overweight Obese/very obese	10 (38.5%) 6 (23.1%) 10 (38.5%)	40 (28.0%) 51 (35.7%) 52 (36.4%)	.39

Three-Month Changes Among Freshplace and Control Group Participants

The change from 3 months follow up to baseline measures were calculated (3 months measure – baseline measure) and analyzed to compare Freshplace participants and the control group for food security, participation in SNAP and diet quality. The sample size for these analyses changed due to missing survey data; therefore results below are interpreted using Freshplace (n= 58) and control group (n= 52).

Three-Month Changes in Food Security

While changes for food security at 3 months were not statistically significant, the total group of food pantry participants and each subgroup (Freshplace and control) experienced a decrease in the number of food insecure participants (table 11). Seventy-one percent of all food pantry participants were considered food insecure, compared to 85% at baseline. However, more Freshplace participants moved into food secure status over three months, shown by an 18% decrease in those considered food insecure (84% at baseline to 66% at 3 months). While 9% of control participants become more food secure (86% at baseline to 77% at 3 months).

Table 11. Frequency of Food Security for Control and Freshplace 3-Months

Characteristic	Control		Freshplace		P Value
	N	%	N	%	
Food Security					
Food secure	12	23.1	20	33.9	.67
Food insecure	40	76.9	39	66.1	.21

Participation in Food Assistance Programs at Three-Months

Among those receiving food assistance, 74.3% of households receiving

SNAP, 77.5% of households receiving free or reduced school meals, 79.3% of those using soup kitchens and 100% of those receiving WIC benefits remained food insecure.

Three-Month Changes in Food Assistance Program Participation

Change in program participation rates over three months were not statistically significant (table 12), however frequency of use of soup kitchen at 3 months was close to nearing significance ($p = .06$). Freshplace participants tended to report no longer using soup kitchens to obtain food more frequently than did Control group participants. Seven new households were enrolled in SNAP at Freshplace, compared to 3 households in the control group. This enrollment may have seen an even larger increase if missing data was incorporated. There were an equal number ($n = 35$) of total participating households receiving SNAP at 3 months from each group. One household in the control group went from receiving SNAP benefits at baseline to not receiving SNAP at 3 months follow-up.

Table 12. Frequency of Food Assistance Participation for Control and Freshplace at 3 Months

Characteristic	Control		Freshplace		P Value
	N	%	N	%	
Food Pantry					
Yes	51	98.1	59	100.0	.47
No	1	1.9	0	0.0	
Soup Kitchen					
Yes	18	34.6	11	18.6	.06
No	34	65.4	48	81.4	
SNAP					
Yes	35	67.3	35	59.3	.38
No	17	32.7	24	40.7	
WIC					
Yes	1	1.9	3	5.1	.62
No	51	98.1	56	94.9	
Free/Reduced Price Meals					
Yes	17	32.7	23	39.0	.49
No	35	67.3	36	61.0	

Three-Month Diet Quality Associations Among Total Sample

When comparing diet quality changes from 3 months to baseline for the total sample, statistically significant differences were found for age and average fat snack intake ($p = .01$), with older participants consuming more fat and snacks than younger participants (<50 years old). Among Freshplace participants, women consumed less fiber than men ($p = .03$). In the control group, a significant difference ($p = .05$) was found for average dietary fiber intake and ethnicity, with Blacks and West Indians consuming more fiber than Hispanic/mixed ethnicities. Food insecurity and vitamin C intake approached significance ($p = .06$) in the control group. No significant differences were found for average dietary intake, education, employment or marital status among either sample.

Three-Month Average Nutrient Intake

Average nutrient intake at 3 months is shown in table 13. Freshplace participants had an average fruit and vegetable score of 13.0 (<5 servings per day), which is greater than that for the Control participants (score of 9.9 or <3 servings/day), but still less than the recommended 5-9 servings each day. Despite Freshplace participants having a higher average of fat and snack intake than Control participants (23.1 versus 28.6), the snack intake is reflective of a diet that is very high in fat. As anticipated from average fat and snack intake results, Freshplace participants had significantly higher daily average intakes for total fat (109.9g/day), saturated fat (31.9 g/day) and cholesterol (302.4 g/day, when compared to the control group (94.6 g/day; 27.7 g/day; 269.9 g/day, respectively). Dietary fiber intake was the most similar nutrient intake between the two groups. When assessing daily micronutrient intakes, Freshplace participants had greater average intakes of vitamin C and magnesium, compared to the control group. The control group participants had only a slightly higher average intake of potassium than Freshplace participants.

Table 13. Mean Dietary Score (Standard Error of Mean) for Control and Freshplace at 3-Months

Characteristic	Control	Freshplace	P Value
	Mean (SEM)	Mean (SEM)	
Fruit and Vegetable Score			
Baseline	11.0 (.50)	11.0 (.52)	.93
3 Months	9.7 (.66)	13.0 (.66)	.00
Fat and Snack Score			
Baseline	26.5 (1.08)	27.9 (1.08)	.36
3 Months	23.1 (1.60)	28.6 (1.41)	.01
Daily Nutrient Intake			
Total Fat (g/day)			
Baseline	102.7 (2.6)	106.4 (2.5)	.32
3 Months	94.7 (3.9)	109.9 (3.4)	.00
Saturated Fat (g/day)			
Baseline	30.7 (.99)	31.8 (.99)	.42
3 Months	27.7 (1.4)	31.9 (1.3)	.31
Dietary Cholesterol (g/day)			
Baseline	296.5 (9.2)	305.68 (9.3)	.48
3 Months	269.9 (13.0)	302.48 (11.8)	.07
Dietary Fiber (g/day)			
Baseline	14.5 (.46)	14.5 (.47)	.98
3 Months	13.6 (.62)	15.3 (.57)	.04
Vitamin C (mg/day)			
Baseline	99.8 (3.8)	100.1 (3.9)	.94
3 Months	90.7 (5.2)	109.5 (4.7)	.01
Magnesium (mg/day)			
Baseline	274.6 (7.7)	273.7 (8.1)	.94
3 Months	257.1 (10.6)	282.9 (9.3)	.07
Potassium (mg/day)			
Baseline	2620.3 (72.0)	2616.8 (75.2)	.97
3 Months	1181.1 (54.9)	1060.1 (47.8)	.10

Three-Month Changes In Diet Quality Scores

Changes in diet quality were assessed for each participant by subtracting 3 month measures from baseline measure for fruit and vegetable score, fat and snack score and seven daily nutrient intake values (total fat, saturated fat, dietary

cholesterol, dietary fiber, vitamin C, potassium, magnesium) as shown in table 14. Overall Freshplace participants had greater mean changes than the Control participants for all diet quality measures. As hypothesized, 61.2% (n=36) of Freshplace participants reported an increase in their fruit and vegetable intake over 3 months, compared to 49% (n=26) of the control group. However, the control group showed a greater change in fat and snack scores. Approximately half of Freshplace participants had a decrease in their fat and snack score, compared to 61.1% of the control participants.

Significant differences ($p < .05$) for the change in dietary intake from baseline to 3 months among Freshplace and the control group were found for fruit and vegetable intake ($p = .04$), dietary fiber ($p = .03$), vitamin C ($p = .03$), and magnesium ($p = .03$) (table 14).

Table 14. Change Scores from Baseline to 3-Months for Mean Diet Quality Scores

Characteristic	Control (n = 52)	Freshplace (n= 58)	P Value
	Change (SEM)	Change (SEM)	
Fruit and Vegetable Score	-.321 (.62)	1.525 (.63)	.04
Fat and Snack Score	-2.384 (1.20)	.483 (1.23)	.10
Daily Nutrient Intake*			
Total Fat (g/day)	-5.723 (2.89)	1.158 (2.95)	1.0
Saturated Fat (g/day)	-2.098 (1.06)	.425 (1.08)	.10
Dietary Cholesterol (g/day)	-18.60 (9.38)	3.765 (9.60)	.10
Dietary Fiber (g/day)	-.399 (.50)	1.192 (.52)	.03
Vitamin C (mg/day)	-3.554 (4.46)	10.627 (4.62)	.03
Magnesium (mg/day)	-6.246 (7.83)	18.678 (8.13)	.03
Potassium (mg/day)	-1333.31 (85.17)	-1487.43 (95.58)	.23

Three-Month Changes in Weight Status

The average BMI for Freshplace participants (29.3) indicated overweight, while the control participants average BMI (30.7) indicated obesity. A significant change in BMI was not anticipated due to a short period of elapse between survey follow-ups.

DISCUSSION

This study explored the possible consequences associated with food insecurity in relation to participation in food assistance programs, diet quality, and health, and compared outcomes for Freshplace, a novel new food pantry with a control group receiving food from traditional pantries. Findings suggest the need for improving the nutritional status of food pantry users in the North End of Hartford, and the available safety net of food assistance programs. A strength of this study is that it utilized validated measures of food security status, diet quality, and BMI. Food insecurity is a widespread measure that captures one of the daily struggles experienced by this population.

Food Security

The use of client-choice food pantries, such as Freshplace, may play a role in changing the level of food security experienced by participants. Over three months the number of food insecure participants decreased in the total group by 13%, decreased 19% for Freshplace participants, and decreased 9% for the control group. The use of Freshplace showed a greater change in becoming food secure over 3 months compared to the control thus supporting the hypothesis (H2).

The influence of food insecurity among low-income households directly affects the food security status of the surrounding community. Community food security focuses on the underlying social, economic, and institutional factors within a community that affect the quantity, quality, and affordability of food (Kantor, 2001). While Connecticut is the second wealthiest state in the U.S.,

Hartford is the second poorest medium-sized city in the country, with an estimated poverty rate of 30.6% for 2010. The poverty rate for the neighborhood in this study is higher, at 39.3% (City Data, 2011). Poverty has been associated with food insecurity and hunger (Boyle et al, 2006; Coleman-Jensen et al, 2011). The prevalence of food insecurity (85%) in this sample was almost 6 times greater than the U.S. average rate (14.5%) in 2010 and over 7 times the Connecticut average rate of household food insecurity (12.7%) (Coleman-Jensen et al, 2010; FRAC, 2010). Among food insecure households at baseline, about one third were experiencing low food security and half were experiencing very low food security, meaning they were experiencing food insecurity with hunger by members including children. Of households considered food secure, half were experiencing marginal food security, or some worries or difficulties in obtaining enough food.

In this sample, the majority of households were predominately Black, single, and female, all characteristics associated with food insecurity in the United States (Coleman-Jensen et al, 2011). Race and food insecurity were close to reaching significance ($p = .08$). Approximately 85% of the North End is Black, with a very strong Caribbean presence, 14% is Hispanic, less than 1% is Asian and Caucasian and approximately 23% are foreign-born residents (Upper Albany Main Street, Inc (UAMS), 2009). Less than 60% of Hartford's North End residents possess a high school degree and only 5% are college graduates (UAMS, 2009). The study sample reflects the demographics of the neighborhood. Residents of this area represent a largely unstudied high-risk population with

respect to food insecurity and nutritional health.

Participation in Food Assistance Programs

Soup kitchens and SNAP were the two most used food assistance programs among this sample of food pantry participants. Enrollment rates show that food pantry users were more likely to use private food assistance programs more often than public programs. Results for participation in food assistance programs were consistent with those of Feeding America from *Hunger in America 2010*, which found that emergency food from pantries are now a part of households' long-term strategies to supplement monthly shortfalls in food. This is evident among Hartford's North End pantry users who utilize an average of three pantries or more on a weekly basis. Yet, it should be noted that households in this study, all receiving emergency food assistance, were still categorized as food insecure. This indicates the unmet needs of food pantry clients and explains the reoccurring use of emergency food assistance programs (Robaina, 2011). The 2010 study also found that among those receiving SNAP benefits, over half (58%) are recurrent or frequent clients, suggesting that clients need additional help from food banks and SNAP benefits do not go far enough in helping families meet their basic nutritional needs. The high levels of household food insecurity represented here present additional concern about the dependence of charitable food assistance programs as a response to hunger. While SNAP alleviates some of the effects of food insecurity on the health status of Hartford's North End children and families, it did not prevent the majority from being food insecure.

As other research on emergency food providers has shown, a large number of these food pantry recipients were not enrolled in SNAP (41.5%) as well as WIC benefits (46%) (Feeding America, 2010). The reason emergency food recipients do not apply for benefits is not well understood, but access to enrollment offices and lack of eligibility information are considerable factors. Since this sample is largely of West Indian decent, it is likely that concern of immigration status or language gap may pose a barrier to enrolling in a federal program such as SNAP. Access to welfare offices tends to be limited, especially for the elderly and working poor. Lack of transportation options, experienced by 80% of participants, and conflicting office hours with work and childcare responsibilities may account for the notably low percentage of families participating in programs such as WIC (O'Brien et al, 2000).

Diet Quality

As supported by previous research and hypothesized, food insecurity was significantly associated with low fruit and vegetable intake. Food pantry participants in this study had diets low in fruits, vegetables, dietary fiber, potassium, and magnesium and diets high in fat, saturated fat, and cholesterol. These findings are consistent with research of U.S. adults living in food-insecure households (Dixon et al, 2001; Rose et al, 1997; Tarasuk et al, 1999). As hypothesized, Freshplace participants had a greater increase in fruit and vegetable scores, along with slightly higher meat and snack scores (total fat, saturated fat and cholesterol), and optimal vitamin C and potassium over 3 months. The control group had less fruit and vegetable intake, lower meat and

snack scores, and optimal magnesium intake. Freshplace participants had greater mean score changes over 3 months than the control group for all diet quality measures which may have occurred due to an increase in their overall calorie intake. Dietary measures were compared to the Dietary Guidelines for American which provides evidence-based nutrition information for people 2 years and older. The recommendations also serve as a basis for food and nutrition education programs (USDA: HHS, 2010).

This food pantry population averaged <4 serving of fruits and vegetables each day, while almost half consumed less than three servings each day. Freshplace participants averaged <4 servings of fruit and vegetables a day, one more serving than the control group. Americans 4 years and older, along with Hartford pantry users, are not consuming the recommended 5-9 servings each day. Although it was a small portion of the participants, it was alarming to find that some pantry users in this study were going some days without consuming any fruits or vegetables. Over 3 months, Freshplace participants reported an increase in their fruit and vegetable intake, while over one third of pantry users in the control group had a decrease in their fruit and vegetable intake. The increased intake of fruits and vegetables among Freshplace participants may be due to twice monthly access to a larger variety of fresh produce.

At baseline, this pantry population received desirable amounts of vitamin C (≥ 75 mg/day) but lacked intake of magnesium (< 420 mg/day) and potassium ($< 4,700$ mg/day). Potassium and magnesium are two of the four nutrients (along with calcium and vitamin D) of concern among Americans (USDA, 2010). While

the intake of these nutrients is a concern for the average person, it becomes an even greater concern among disadvantaged populations (Mello et al, 2010).

Over 3 months, Freshplace participants had greater average intakes of vitamin C and magnesium, while the control group had slightly higher average intake of potassium. Dietary potassium intake can help lower blood pressure by negating the adverse effects of sodium (USDA, 2010). Evidence suggests that African Americans and those with hypertension specifically benefit from increasing potassium intake. It would be beneficial for the 66% of pantry users and their family members with high blood pressure to learn more about the benefits of potassium and increase access to rich food sources like fruit, vegetables, nuts, dairy products, meat and seafood sources.

Findings showed that food pantry users had diets high in total fat (mean 104.5 g/day) and saturated fat (mean 31.2 g/day). Pantry participants consumed almost twice as many calories from total fat (40-50%) than recommended (20-35%) by *The Dietary Guidelines for Americans 2010*. While Freshplace participants consumed 4 more grams of fat each day, both groups' fat and snack scores correlated with diets very high in fat. Over three months, more control group participants showed a decrease in their fat and snack scores, than Freshplace participants. Average saturated fat contributed 14% of calories among all food pantry users, which is higher than the American average (11%) and the USDA recommended amount (10%) (USDA, 2010). Similar to average American diets, major sources of saturated fat in food pantry users came from margarine, butter, vegetable oil, eggs, full-fat cheese, fried chicken, and

corn/potato chips (USDA, 2010). Opposite from the majority of Americans, over half (54%) are consuming whole milk on a regular basis. The *Dietary Guidelines for Americans 2010* recommended 3 cups of low-fat or fat-free milk and milk products per day for those 9 to 18 years of age. Choosing low-fat milk and milk products provides the same nutrients with less saturated fat and thus fewer calories. . Consumption of whole milk may be based on cultural preferences, and therefore targeted information may be needed to create behavior change for lower-fat milk. Food pantry suppliers need to select items that are lower in saturated fat such as lean red meats, low-fat dairy products, beans, seafood and soy products, and provide more items high in unsaturated fats such as vegetable oils, avocados, poultry and unsalted nuts and seeds.

It should be noted that when analyzing total fat intake one must consider the other subcomponents besides saturated fat, such as monounsaturated and polyunsaturated fats, which may have different health effects on blood cholesterol and cardiovascular risk (USDA, 2010). Block et al notes that the Food Screener does a good job at identifying individuals with high saturated fat intake, which correlates more highly than that of total fat. If a respondent scores high on this screener, they most certainly have a high saturated fat intake and a high monounsaturated fat intake (Block et al, 2000).

Approximately half (52.3%) of participants were within desirable intake and 47.8% were above desirable intake for daily cholesterol. Dietary cholesterol has been show to raise blood LDL cholesterol levels and increase risk of cardiovascular disease. Cholesterol intake among this food pantry population is

alarming considering the high number of those who reported having been told by a doctor that they or someone in their household has diabetes or high blood pressure, which are conditions related to cardiovascular disease. For individuals at risk of cardiovascular disease, cholesterol intake should remain <200mg/day (USDA, 2010).

The average dietary fiber intake among this sample was half the recommended intake of 25-30 grams per day (USDA, 2010). This is not surprising considering the low consumption of fruits and vegetables in this sample. Sources of fiber in this sample of pantry users came from dark bread, beans and fiber cereal. Male pantry participants had greater average intakes compared to female pantry users, which may be influenced by an overall greater calorie intake. Freshplace participants only consumed one gram more of dietary fiber a day than the control group. Fiber helps to promote digestive health, reduce cholesterol, stabilize blood sugars and increase satiety, which in turn minimizes chances of chronic disease and overeating. High-fiber foods are under consumed in the American diet and replaced with unfavorable refined flour products. In order to meet recommendations for fiber, pantry users need to increase their consumption of whole grains, fruits, vegetables, nuts, beans and peas, that are naturally high in fiber.

The Block Food Screener used in this study was developed to simply assess fat, fiber, and fruit and vegetable intake. These nutrients are most closely associated with morbidity and mortality, and are of interest to physicians, epidemiologists, nutritionists, and diet-conscious individuals. The screeners

provide a reasonably accurate ranking of nutrient intake, similar to that of a full-length dietary questionnaire, and therefore can help identify persons with high-fat or high-cholesterol intake, or with low fruit and vegetable intake. Because the screeners are brief, they offer an inexpensive way to provide basic dietary evaluation and feedback to all patients (Block et al, 2000).

Access to Healthy Foods

The low consumption of fruits and vegetables and high consumption of fat and snacks may be due to environmental factors such as the availability of local-area grocery stores that offer healthy, affordable products and produce to North End residents. Supermarkets characteristically offer a larger variety of food with cheaper prices than small stores, yet are less available in low income communities. High food demands drive low-income families to frequent fast food chains and convenience marts, which are more expensive and lower quality (Powell et al, 2007). The growth of fast food and gas station mini-marts may also explain the high fat and snack intake consumed by 85% of food pantry participants.

Nutrition Education Efforts

Future interventions with food-insecure individuals should include nutrition education as well as efforts to increase access and availability to healthier foods, particularly in food pantries. The Cooking Matters program helps families improve the way they shop, cook and eat. In a typical week, a low-income family will cook 4 dinners from scratch, 2 from a package, and 1 from a fast food restaurant (Share Our Strength, n.d.). In 2010, Cooking Matters taught over 1,000 courses

to close to 12,000 low-income individuals. Nationally, program graduates showed improvements in their eating habits, food budgeting skills and food safety practices, all behaviors proven to reduce food insecurity and improve overall health. (Share Our Strength, n.d). The Cooking Matters program is a beneficial component to increasing food security as it teaches skills that will last a lifetime and beyond as they can share knowledge, techniques and recipes with relatives and friends. Nutrition education opportunities are often a community collaboration and beneficial to both parties. While undergraduate students were able to practice counseling skills and fulfill requirements for their community nutrition rotation, Freshplace members were able to ask individualized questions and learn about nutrition.

This research and its findings will help to fill a gap in the current literature regarding the effects of food pantries on food security, food and nutrition assistance program participation and diet quality.

Implications

This research explored relationships between food security and diet quality of food pantry users in the North End section of Hartford and those enrolled in Freshplace. The community founders of Freshplace, Foodshare, Chrysalis Center and the Junior League of Hartford, can use the information to encourage more community involvement and further development of the Freshplace program. This information can also help encourage more donations of healthy items such as produce, lean meats, low-fat dairy, and whole grains to food pantries. In addition, these positive preliminary results can provide support for community contributors in improving food security and diet quality of this population by applying for additional grants to continue running Freshplace and expand research regarding community food security.

This information will also serve as an important resource for community and public health educators who serve, educate and assist food pantry participants. This research may help them to better address the needs and knowledge gap among the food pantry population.

Client Choice Pantries

With the demands being stressed by the current population, reliance on private food assistance programs to solve the problem of hunger is unrealistic. While food assistance programs do help to alleviate hunger, they temporarily mask the symptoms. The traditional food pantry system of handing out pre-bagged groceries for clients from a posted list are not fitting the lifestyle needs of today's clients. While well-meaning, often food donations are not appropriate for

the health conditions or cultural needs of food pantry clients. As a result, new models such as client choice pantries, and pantries offering case management, are being found.

Researchers at Purdue University Extension in collaboration with the Indiana TEFAP (The Emergency Food Assistance Program) found that most of us take for granted the wide-variety of choices and more importantly the control over what we buy at the grocery store. No matter what income level, people should be able to select their own food and control what they eat, a concept that carries over into client choice pantries. Client choice is a food distribution system used at the pantry-level that allows clients to receive greater amounts of food while maintaining their dignity in using the pantry. Clients choose their own food from shelves as they would at a grocery store. Less waste, resulting in less costs, has also been seen as clients select food based on their individual preferences, needs and circumstances and not what is solely given to them (Purdue University, 2005). Within the client choice model there are several methods to implement depending on the facility, staff and equipment. Other systems include the point system, where clients are allocated points depending on family size and items are labeled with dotted stickers indicating the cost it would be at the grocery store; the total number of items method, where each family is given a total number of items to choose based on size and there are no constraints except for the available amount of food; and the item list methods which provides clients a list of available items on paper and allows them to choose from that list (America's Second Harvest, n.d.).

Like the North End's food pantry users, most pantries are serving families or single mothers who may have conflicts with traditional hours of operation. Flexibility in pantry hours become important to families who may have to choose between going to the pantry or losing income by taking work off. Freshplace meets the needs by serving clients on both weekdays and weekends.

Community-Based Initiatives

Low-income households, specifically those in rural areas and poor central cities, have less access to high quality, reasonably priced foods than other households (Algert et al, 2006). There is a need for public health efforts to help modify the current food environment. Identification of the locations with high concentrations of food pantry clients would provide a potential incentive to increase fresh fruit and vegetable access via mobile food trucks (Algert et al, 2006). Community-based initiatives, such as community gardens and farmers markets, have been established in communities to increase the availability of high quality and affordable foods for residents, especially low-income households (Jones et al, 2011). Other food security programs include food recovery programs, community supported agriculture and SNAP outreach programs. Many local grocery stores participate in food recovery programs where unused products are frozen and then donated to food banks for distribution to clients. More programs such as these and Freshplace are needed to simultaneously boost the effectiveness of nutrition assistance and education programs. In rural communities these programs also help to strengthen the traditional relationship that exists between farmers and urban consumers (Kantor, 2001).

LIMITATIONS

There are existing limitations to this study. All data, except for height, weight, and BMI, were self-reported by each participant which increases social response biases. The survey was also conducted in person by a member of the research team, which may have influenced participants' responses, especially in regards to household food security and dietary intake. For example, food insecure women may be hesitant to report that their child went without food for a day in fear that they could be taken out of their care.

Because data was collected over a 14-month period, each season presented a new difficulty in collecting data. In the summer months, pantry users came more frequently when children were home from school and needed to serve additional meals. Winter months, holidays and inclement weather changed the pantry schedule and attendance rates. Changes to weight protocol also had to be adjusted to account for additional layers, winter jackets, and heavy boots for BMI calculations.

Despite using the validated Block Food Screen to measure diet quality, Block et al (2000) suggests that the screener may be less appropriate for persons with unusual dietary practices, such as immigrants, a population that makes up a large portion of this sample. As a participant may have responded to eating pizza "once a month or less," the minimal fat and snack response, they may instead consume other high fat cultural items weekly such as tamales or fried plantains, which would be missed on the screener.

The findings of this study are specific to pantry clients who attended two food pantries and reside in the North End of Hartford, which may lead to coverage bias. Considering the niche of this group, the findings from this population may not be generalized to other pantry populations.

CONCLUSION

While even the average American is not meeting the recommendations of Dietary Guidelines, the consequences of poor nutrition become exacerbated among the food-insecure. Based on the risk of food insecurity and nutrient insufficiency present in this population, food distributors and donors to food pantries need to reevaluate the nutritional quality of products being offered to pantry participants. To fill the gap, more fresh fruits and vegetables are needed in food pantries where millions of Americans rely on food. While cost of food purchases is a barrier to dietary change, it is necessary for the government to continue funding for food assistance programs and subsidize healthier foods.

The food environment of food pantry clients needs further examination as access to fresh produce and other healthy foods differs greatly between poor ethnic and wealthier non-ethnic neighborhoods. Food pantry clients, many living in poor ethnic neighborhoods, are at the greatest risk for inadequate intake of fruits and vegetables (<4 servings/day) as many emergency food assistance programs do not always supply fresh produce. Identification of neighborhoods with high concentrations of food insecurity and food pantry clients with limited access to stores carrying fresh produce could provide a potential solution to increase fresh fruit and vegetable intake via community-based interventions. These interventions could involve food retailers, mobile produce trucks, and more produce in food pantries, such as Freshplace.

To help prevent food insecurity and obesity, households must have routine, steady, and reliable access to healthy food. Grocery stores offer an

outlet to reach and serve low-income populations. Food-insecure individuals can benefit from additional knowledge and skills on how to manage their food budgets by learning how to make food and their money last. Supermarket dietitians can serve as a resource to food insecure families by teaching about proper nutrition and how to shop on a budget. In this economy, it is vital for this population to adapt to changing food costs and learn budget management. Future efforts are needed to provide low-income households with a source of fresh fruits and vegetables, low-fat dairy products, lean meats and seafood.

The use of case management within food pantries can help address the underlying issues of poverty to help prevent obesity and malnutrition. Policy changes along with other intervention strategies should simultaneously consider these nutritional problems, without putting families at more risk for food insecurity and under nutrition. The role of food and nutrition assistance programs such as SNAP and WIC should be reevaluated to more effectively promote healthful food choices and reduce risk for obesity to underserved populations such as the homeless, children of undocumented immigrants and those with limited English skills (Larson et al, 2011).

The link between food insecurity, poor diet quality and obesity explained here, supports the evidence that nutritional problems do coexist. This further emphasizes the need to reduce the risk of food insecurity with adequate funding for food and nutrition assistance programs, availability of healthy food choices, nutrition education and programs to help build the livelihood of food insecure individuals, families and households.

APPENDIX 1

Questions Used To Assess the Food Security of Households in the CPS Food Security Survey

1. “We worried whether our food would run out before we got money to buy more.” Was that often, sometimes, or never true for you in the last 12 months?
2. “The food that we bought just didn’t last and we didn’t have money to get more.” Was that often, sometimes, or never true for you in the last 12 months?
3. “We couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for you in the last 12 months?
4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn’t enough money for food? (Yes/No)
5. (If yes to question 4) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
6. In the last 12 months, did you ever eat less than you felt you should because there wasn’t enough money for food? (Yes/No)
7. In the last 12 months, were you ever hungry, but didn’t eat, because there wasn’t enough money for food? (Yes/No)
8. In the last 12 months, did you lose weight because there wasn’t enough money for food? (Yes/No)
9. In the last 12 months did you or other adults in your household ever not eat for a whole day because there wasn’t enough money for food? (Yes/No)
10. (If yes to question 9) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

(Questions 11-18 were asked only if the household included children age 0-17)

11. “We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food.” Was that often, sometimes, or never true for you in the last 12 months?
12. “We couldn’t feed our children a balanced meal, because we couldn’t afford that.” Was that often, sometimes, or never true for you in the last 12 months?
13. “The children were not eating enough because we just couldn’t afford enough food.” Was that often, sometimes, or never true for you in the last 12 months?
14. In the last 12 months, did you ever cut the size of any of the children’s meals because there wasn’t enough money for food? (Yes/No)
15. In the last 12 months, were the children ever hungry but you just couldn’t afford more food? (Yes/No)
16. In the last 12 months, did any of the children ever skip a meal because there wasn’t enough money for food? (Yes/No)
17. (If yes to question 16) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
18. In the last 12 months did any of the children ever not eat for a whole day because there wasn’t enough money for food? (Yes/No)

APPENDIX 2

Evaluating Freshplace¹

COVER SHEET

I want to ask you a few questions about you and the people you live with.
Please remember, your answers will be kept completely confidential.

Contact Information:

Member # _____

First Name _____ Last Name _____

Home Phone _____ Cell Phone _____ No Phone _____

Address _____ Apt. # _____ ZIP

Please name an emergency contact who does not live with you but knows you well and
how to contact you:

Name of Friend or Relative _____ Phone _____

Name of Friend or Relative _____ Phone _____

Once randomize into two groups, mark which group:

_____ Freshplace _____ Food Pantry comparison group

[This cover sheet stays with the Freshplace client file,
and will be filed separately for the UConn files
to maintain the confidentiality of clients.]
BASELINE SURVEY INSTRUMENT

¹ Version 3, revised June 21, 2010.

Member # _____

Date of Survey _____ Interviewer _____

Place of Recruitment: Food Pantry Name _____

Demographic Information:

How many people, including you, live in your household? _____

What is your date of birth? _____

How many children are 5 years of age or under? _____

How many children are between 6 – 17 years of age? _____

Which of the following does your family use to get food?

For all YES answers, ask how often they use the program

_____ Soup kitchens Frequency: _____
_____ Food pantries Frequency: _____

If yes to Food pantries, how many different pantries do you usually go to _____

_____ Food Stamps / EBT / SNAP Frequency: _____
_____ WIC Frequency: _____
_____ Free/reduced price school meals Frequency: _____
_____ Earned Income Tax Credit Frequency: _____
_____ Energy Assistance / Rent Rebate Frequency: _____
_____ Other _____ Frequency: _____

How do you describe your race or ethnicity?

_____ Hispanic / Latino _____ Black / African American _____ White

_____ Asian / Pacific Island _____ West Indian Other: _____

What is your marital status?

_____ Single _____ Married _____ Separated _____ Living with Partner _____ Widowed

[Interviewer: please mark based on observation:] **Gender:** _____ Female _____ Male

Food Insecurity / Hunger Survey

(Adapted from Food Security / Hunger Core Module, 3-Stage Design, with Screeners: USDA, FCS: 2/20/97)

Available at <http://www.ers.usda.gov/Briefing/FoodSecurity/surveytools.htm>.)

Now I'm going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was **OFTEN** true, **SOMETIMES** true, or **NEVER** true for your household in the last 12 months, that is, since last (name of current month).

	Often True	Sometimes True	Never True	DK/ Refused
1. The first statement is "We worried whether our food would run out before we got money to buy more."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. "The food that we bought just didn't last, and we didn't have money to get more."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. "We couldn't afford to eat balanced meals." [If needed: Probe: We couldn't eat a variety of foods, we used the same foods over and over.]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SCREENER: If have children, continue to Q4. If do not have children and "sometimes or often true" to any question, go to Q7. If "never true" to all 3 questions, stop and go to Page 5.

	Often True	Sometimes True	Never True	DK/ Refused
4. "We relied on only a few kinds of low-cost food to feed my/our child/the children because we were running out of money to buy food."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. "We couldn't feed my/our child/the children a balanced meal, because we couldn't afford that."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. "(My child was/ My children were) not eating enough because we just couldn't afford enough food."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SCREEN Two: Questions 7-12 [INTERVIEWER: If "often true" or "sometimes true" to any one of Questions 1-6, then continue to Q7; otherwise, go to Page 5.]

7. In the last 12 months, since last (name of current month), did you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?

☐ Yes ☐ No (Go to Q9) ☐ DK/Refused (Go to Q9)

8. **[IF YES to Q7, ASK]** How often did this happen - almost every month, some months but not every month, or in only 1 or 2 months?

<input type="checkbox"/> Almost every month	<input type="checkbox"/> Only 1 or 2 months
<input type="checkbox"/> Some months but not every month	<input type="checkbox"/> DK/Refused

- | | Yes | No | DK/Refused |
|---|--|---|---|
| 9. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money to buy food? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. In the last 12 months, were you ever hungry but didn't eat because you couldn't afford enough food? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. In the last 12 months, did you lose weight because you didn't have enough money for food? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. In the last 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? | <input type="checkbox"/> Yes | <input type="checkbox"/> No (go to Q14) | <input type="checkbox"/> DK/Refused (go to Q14) |
| 13. [IF YES to Q12, ASK] How often did this happen - almost every month, some months but not every month, or in only 1 or 2 months? | <input type="checkbox"/> Almost every month | <input type="checkbox"/> Only 1 or 2 months | |
| | <input type="checkbox"/> Some months but not every month | <input type="checkbox"/> DK/Refused | |

SCREEN Three: If do not have children, go to Page 5. If have children and If affirmative response to any one of Questions 7-13, then continue to Q14; otherwise, go to Page 5.

14. The next questions are about children living in the household who are under 18 years old. In the last 12 months, since (current month) of last year, did you ever cut the size of (your child/any of the children's) meals because there wasn't enough money for food?

☐ Yes ☐ No ☐ DK/Refused

15. In the last 12 months, did any of the children ever skip meals because there wasn't enough money for food?

☐ Yes ☐ No (go to Q17) ☐ DK/Refused (go to Q17)

16. **[IF YES to Q15, ASK]** How often did this happen - almost every month, some months but not every month, or in only 1 or 2 months?

☐ Almost every month ☐ Only 1 or 2 months
☐ Some months but not every month ☐ DK/Refused

- | | Yes | No | DK/Refused |
|--|--------------------------|--------------------------|--------------------------|
| 17. In the last 12 months, (was your child/were the children) ever hungry but you just couldn't afford more food? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. In the last 12 months, did (your child/any of the children) ever not eat for a whole day because there wasn't enough money for food? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Self Efficacy Scale for Food Security

It is often hard to prepare meals the way we might want to. There are usually a lot of demands on our time, and other things often get in the way.

Given these problems, I would like to ask you how **confident** you are that you can do some things that are related to getting enough food for your family.

For each of the following items I would like you to tell me, on a scale from 1 to 4, how confident you are that you can do each thing.

The scale is:

1 = not at all confident, 2 = not very confident, 3 = somewhat confident, 4 = very confident

How confident are you that you can *(Repeat this stem for each item)*:

1. Plan meals ahead of time?
1 2 3 4
2. Make your food money last all month?
1 2 3 4
3. Make a shopping list before going to the grocery store?
1 2 3 4
4. Compare prices before you buy food to get the best deal?
1 2 3 4
5. Make low-cost meals?
1 2 3 4
6. Buy foods that you think are healthy for your family?
1 2 3 4

Fruit, Vegetable, Fiber and Fat Screener

Think about what you usually ate last month. Think about the foods you ate at breakfast, lunch, dinner, snacks and eating out. About how many times per month, week or day did you eat the following foods?

Fruit, vegetable or grain	Less than 1/WEEK	Once a WEEK	2-3 times / WEEK	4-6 times / WEEK	Once a DAY	2+ a DAY
100% Fruit juice, like orange, apple, grape, (not soda or juice drinks)						
How often do you eat any fruit, fresh or canned (not counting juice)						
Vegetable juice, like tomato or V-8						
Green lettuce salad						
Vegetable soup or stew with veggies						
Any other vegetables, including peas, corn, broccoli or any other kind						
Fiber cereals like Raisin Bran, Total or Shredded Wheat						
Brown rice						
Beans such as pinto, kidney or lentils						
Dark bread such as whole wheat or rye						

Again, thinking about your eating habits over the past 30 days. About how often do you eat each of the following foods? Remember breakfast, lunch, dinner, snacks and eating out.

Meats and Snacks	1/ MONTH or less	2-3 times/ MONTH	1-2 times a WEEK	3-4 times a WEEK	5+ times a WEEK
Hamburgers, ground beef, meat burritos, tacos					
Beef or pork, such as steaks, roasts, ribs					
Fried chicken					
Hot dogs, or sausage					
Bacon or breakfast sausage					
Salad dressings (not low-fat)					
Margarine, butter or mayo on bread					
Margarine, butter or oil in cooking					
Eggs (not Egg Beaters or egg whites)					
Pizza					
Cheese (not low-fat)					
Whole milk					
French fries, fried potatoes					
Corn chips, potato chips or crackers					
Doughnuts, pastries, cake, or cookies					
Ice cream					
Soda (not diet)					

Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet & Farley, 1998)

Next, we are interested in how you feel about the following statements. For each statement, please tell me how you feel about each one based on the following scale:

- 1 = Strongly Disagree
- 2 = Disagree a little
- 3 = Neutral
- 4 = Agree a little
- 5 = Strongly Agree

	SD	D	N	A	SA
1. There is a special person who is around when I am in need.	1	2	3	4	5
2. There is a special person with whom I can share my joys and sorrows.	1	2	3	4	5
3. My family really tries to help me.	1	2	3	4	5
4. I get the emotional help and support I need from my family.	1	2	3	4	5
5. I have a special person who is a real source of comfort to me.	1	2	3	4	5
6. My friends really try to help me.	1	2	3	4	5
7. I can count on my friends when things go wrong.	1	2	3	4	5
8. I can talk about my problems with my family	1	2	3	4	5
9. I have friends with whom I can share my joys and sorrows.	1	2	3	4	5
10. There is a special person in my life who cares about my feelings	1	2	3	4	5
11. My family is willing to help me make decisions	1	2	3	4	5
12. I can talk about my problems with my friends.	1	2	3	4	5

Social Capital Scale:

Now I'm going to ask you some questions about your neighborhood. For each of these questions, please tell me whether you strongly disagree = 1, disagree = 2, agree = 3 or strongly agree = 4.

	SD	D	A	SA
1. People around here are willing to help their neighbors.	1	2	3	4
2. This is a close-knit, or "tight" neighborhood where people generally know one another.	1	2	3	4
3. If I had to borrow \$30 in an emergency, I could borrow it from a neighbor.	1	2	3	4
4. People in this neighborhood generally don't get along with each other.	1	2	3	4
5. People in this neighborhood can be trusted.	1	2	3	4
6. If I were sick I could count on my neighbors to shop for groceries for me.	1	2	3	4
7. People in this neighborhood do not share the same values.	1	2	3	4

Is anyone in your family a member of a social or civic organization such as the Boy Scouts, a church, or the PTA? _____ Yes _____ No

How long have you lived in your house or apartment? _____ years

Health Information

1. Has a doctor ever told you or someone in your household that you:
Have diabetes? _____ Yes _____ No
- 1a. If yes, are you getting treatment or taking medication? _____ Yes _____ NO

2. Has a doctor ever told you or someone in your household that you:
Have high blood pressure? _____ Yes _____ No
- 2a. If yes, are you getting treatment or taking medication? _____ Yes _____ NO

Now I want to measure your height and weight.

3. Measuring using scale and stadiometer:

Height (without shoes) _____ inches Weight (without shoes) _____ pounds

4. BMI calculation (**entered later in office**): _____

_____ Underweight _____ Normal Weight _____ Overweight _____ Obese

5. How often do you get moderate exercise, like walking for at least 20 minutes?

_____ Once/month _____ 2-3 x/month _____ 1x/wk _____ 2-3 x/wk _____ 4-6x/wk _____ 1x/day

Self Sufficiency Scale ²
(Missouri Community Action Family Self Sufficiency Scale)

IMPORTANT	IMPORTANT	IMPORTANT	IMPORTANT	IMPORTANT
The Scale should be administered in the presence of the family, with their full participation				
Text in Bold should be read verbatim				
Numbers in parentheses at the end of items indicates the appropriate score for that response				

Tell the family:

Now I want to ask you some questions about your family.

We will be looking at your CURRENT situation, specifically how your ability to be self-sufficient is influenced by certain situations.

Your input is very important. We will look at ten areas. For each area I will ask several questions about your CURRENT situation.

If you are not comfortable answering a question, please let me know and decline the question. Please do NOT give inaccurate information.

We will do a follow-up interview in about three months so we can see your progress and evaluate the plan we put together.

Do you have any questions?

EDUCATIONAL ATTAINMENT

1a. What is the highest grade you completed in school? (Circle response)

Grade 1 2 3 4 5 6 7 8 9 10 11 12 HSDIPLOMA GED COLLEGE AS
BS/BA MA

If less than an associate's degree, ASK:

1b. Have you served a trade apprenticeship or completed a technical certificate? _____

1c. Have you continued your education in any other way? For example, have you taken a Certified Nursing Assistant (CNA) course or other vocational courses; attended college classes or schooling provided by your employer?

² Interview for Scale Administration

Missouri Community Action Family Self-Sufficiency Scale

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INCOME

2a. **Where does your income come from? What money do you have coming in?**

Source	Frequency	Amount	Temporary or Permanent

2b. **Is your income enough to pay for your most basic housing, utilities, food, and clothing expenses?** ____ YES ____ NO

If yes and income is permanent, continue:

2c. **Is your income enough to allow for some extras, like birthday gifts and small emergencies under \$100?** ____ YES ____ NO

If yes, continue:

2d. **Is your income enough to allow for emergencies over \$100 and savings?**
____ YES ____ NO

EMPLOYMENT

3a. **Are you employed?** ____ YES ____ NO

If not employed, ASK:

3b. **How long have you been unemployed?** _____

If employed, ASK:

3c. **Is your employment temporary or permanent?** ____ TEMP ____ PERM

3d. **On average, how many hours per week do you work?** _____

3e. **How much do you make per hour?** _____

HEALTH INSURANCE

4a. **Who in your family has health insurance?** _____

If some are covered, ASK:

4b. **Is the coverage through Medicaid, Medicare, Husky, or private insurance?**
(Circle response)

4c. **Does the premium interfere with your ability to pay for housing, utilities, or food?** ____ YES ____ NO

4d. **Do the amounts required for deductibles or copays keep you from using needed services?** ____ YES ____ NO

4e. **Are frequently used services covered by the insurance?** ____ YES ____ NO

PHYSICAL HEALTH

5a. **Does a family member have any health problems that interfere with anyone's ability to work or that require special working conditions?** ____ YES ____ NO

If yes, continue:

5b. **Tell me a little about how the condition impacts their/your ability to work and their/your work attendance.**

MENTAL HEALTH AND SUBSTANCE ABUSE

These next questions make some people uncomfortable. If you don't feel you can answer a question, please let me know and we'll move on to the next section. It's important that I have accurate information. That way, I will be better able to measure changes.

6a. Does anyone in your household have any problems with their emotions or mental health?

___ YES ___ NO

If yes, continue:

6b. Please tell me a little about the situation and how it affects your family.

If necessary, follow-up with questions about impact on finances, housing, utilities, employment, treatment programs, and medication costs.

6c. Does anyone in your household ever use alcohol or drugs in a way that might keep your family from reaching its goals?

___ YES ___ NO

If yes, continue:

6d. Please tell me a little about the situation and how it affects your family.

If necessary, follow-up with questions about impact on finances, housing, utilities, employment, treatment programs, and legal problems.

HOUSING

7a. How do you describe your housing situation? _____

___ Own ___ Rent ___ Temporary/living w friend ___ Transitional/Shelter
___ Homeless

7b. Do you get any help paying your rent? _____

___ Family helping ___ Renters Rebate ___ Section 8

7c. Do you have any problems paying your rent/mortgage on time? ___ YES ___ NO

7d. Have there been any threats of eviction/foreclosure or are you in danger of losing your apt? ___ YES ___ NO

7e. What problems, if any, are there with the plumbing, electrical work, heating, water, or structure of the home? _____

CHILD CARE

8a. **Do you have children under age 13?** ____ YES ____ NO (10)

If yes, continue:

8b. **What arrangements, if any, do you have for your children while you work or attend school?** _____

8c. **Are there any barriers, such as transportation, hours of operation, reliability, or copays that make child care a problem?** _____

8d. **Do you receive any financial assistance for child care?** _____

8e. **How would you describe your child care arrangements in terms of each of the following:**

Safety: _____

Cleanliness and general environment: _____

Nutritious meals: _____

Structured activities: _____

Adult supervision: _____

Age-appropriate toys: _____

8f. **What back-up plan(s) do you have if your usual provider isn't available or your child is ill?**

TRANSPORTATION

9a. **Do you own a car?** ____ Yes ____ No

9b. **Can you borrow a car from a friend or relative?** ____ Yes ____ No

9c. **How do you usually get around when going to work, school, grocery store, and appointments?**

9d. **What problems, if any, do you have with transportation?** For example: reliability, cost, needed routes and schedules, access, need for second car.

If the family has a CAR, ASK:

9e. **How often do you have difficulty paying for gas?**

____ Never ____ Sometimes ____ Frequently

9f. **How dependable is the car?**

____ Very dependable ____ Usually dependable ____ Needs repair now ____ Highly undependable

PSYCHOSOCIAL AND ENVIRONMENTAL STRESSORS

While everyone experiences some amount of stress, sometimes certain stressors interfere with a family's ability to work toward its goals. For example, domestic violence, legal problems, divorce, dissatisfaction with work, heavy debt, stressful relationships, problems with your children, truancy, and the like can make it hard to keep focused on the things you want to do for your family. I'd like to take a moment now for us to discuss any of these, or other stressors, that might CURRENTLY be affecting your family.

10a. Are you CURRENTLY experiencing any stressors that might make it hard for you to achieve your goals? If so, may we talk about them so we can track changes over time?

Stressor(s)

10b. How does the stress impact your ability to take care of your family?

10c. Are you getting help from any other sources to cope with these difficulties?

10d. Have you ever thought about getting help?

Remember, we will repeat these questions again in 3 months and will pay you another \$5 then.

Thank you very much!

|

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